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# THE PRACTITIONER:

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A JOURNAL

OF

THERAPEUTICS AND PUBLIC HEALTH.

EDITED BY

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# THE PRACTITIONER.

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## Original Communications.

### ON THE IMPORTANCE OF EARLY PARACENTESIS IN THE TREATMENT OF ASCITES.

BY EDWARD DRUMMOND, M.D., ROME.

SURGERY, and more especially that branch of it, abdominal surgery, in which my friends Sir Spencer Wells, Lawson Tait, and others have of late years achieved such signal successes, has for a long time almost ceased to come within the range of my professional work; and, indeed, abdominal surgery has become one of the most legitimate of specialities; but there is a class of cases belonging to the border land of medicine and surgery to which special circumstances have of late years directed my attention. I refer to cases of ascites calling for relief by “tapping.”

It was certainly the practice once, and I believe it is still largely the case, to defer this operation too long, and only resort to it as a mere palliative measure, in order to give a few hours or days of respite from the suffering to which the presence of so much fluid in the abdomen naturally gives rise.

I have witnessed a large number of cases of cardiac, renal, and hepatic dropsy in which all the ordinary routine treatment by drugs, hot-air baths, &c., failed to arrest, by a single hour, the onward march of the disease and its accompaniments; where a labouring heart, a cirrhosed liver or disorganised kidney, had its difficulties intensified by the mere hydrostatic pressure of a great mass of fluid distending the peritoneal cavity.

Not to mention the increased difficulty, nay, the almost

impossibility, of necessary movement, exercise, &c., all absorbent action of the vessels must be reduced to a standstill, every function of digestion, assimilation, micturition, defæcation, obstructed; respiration and oxygenation of the blood impeded; the heart's action embarrassed; and the mere weight of fluid rendering compulsory the maintenance of a sitting posture, by day and night, must be fearfully exhausting to a patient in so advanced a stage of disease, in which the blood is so impoverished and so highly charged with the products of arrested secretion.

Proper diet, with a minimum of fluid, and such medicines as acetate of potassium, sulphate of magnesium, nitrous ether, jalap, elaterium and other hydragogue cathartics, and still more perhaps, digitalis, casca or convallaria majalis, are no doubt useful, especially in the early stages, while iodide of potassium with iron and Baillie's pill must not be forgotten. All these however, and many more similar preparations, will only excite illusive hopes.

If the fluid be removed by *early* and, if necessary, *repeated* "tapping," followed by well-regulated firm pressure, then these remedial agents become really potent for good.

It is generally held that such a course of treatment is more especially useful in dropsy dependent upon cirrhosis, but I have found it not less successful in cardiac and renal dropsy, and, in a fair proportion of cases, it has proved *curative*, while in all it has diminished the patient's sufferings, and made his invalid state endurable.

Where an advanced form of Bright's disease, a progressive cardiac lesion, malignant or albuminoid disease of the liver, or like inevitably fatal malady, stands behind, it can of course only be a palliative, but it is a *real* one; it robs a necessarily fatal illness of its worst horrors; gives literally *a breathing space*, a respite from unavoidable suffering, and adds some weeks or months of comfort to a doomed existence.

When, however, the ascites depends on a cause which is temporary—wholly removable or capable of becoming stationary—then paracentesis so practised is the chief means of cure. In any case it is impossible to insist too strongly on the importance of an early recourse to it, as adding tenfold efficacy to otherwise impotent therapeutic means.

## HEMIPLEGIA.<sup>1</sup>

BY THOMAS W. SHORE, M.B., B.Sc. (LONDON).

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(Continued from vol. xxxiv. p. 439.)

To discuss the pathology of such cases as this would be to discuss the causes of uræmia. In a paper which I read two years ago to the Abernethian Society on Bright's disease I dealt with this subject, and expressed the opinion that uræmia was, in many cases, due to anæmia of the brain, and I believe that this has much to do with the causation of these cases of uræmic coma with hemiplegia. That anæmia of the brain alone may cause hemiplegia is shown by some recorded cases of ligature of the carotid artery which have been followed by this symptom on the opposite side of the body to the ligature.

On the other hand some toxic condition of the blood may have something to do with the matter; at least I have a case in which I believe that some blood-poison of a septic nature caused coma, convulsions, and paralysis.

CASE IV.—This is the case of J. H., aged thirty-five. The patient had had a cough with shortness of breath and yellowish expectoration beginning about June 23rd, 1884. On June 30th he had an attack of what he described as "shivers," and again on the evening of July 1st.

He had never had any "fits" of any kind. On admission on July 2nd he appeared to be very dull and stupid, he had a cough, and expectorated a very offensive blood-stained mucus. Nothing abnormal was detected in his chest except râles at the right apex anteriorly and posteriorly, no dulness or bronchial breathing. The heart and urine were natural.

<sup>1</sup> A paper read before the Abernethian Society, Oct. 16, 1884.

On the evening of admission he had two fits of convulsions with coma, each period of unconsciousness lasting about ten minutes. Early on July 3rd he had two similar fits, but more violent. During each the whole body became more or less convulsed, but most especially *the right arm*. At about 12 noon on July 3rd the patient was very drowsy, understood when spoken to, presented no evidence of any paralysis except in *the right arm*, which was completely useless. There were no other signs of disease except a trace of albumin in his urine, and râles at the right apex of the lung, with rusty foetid sputa. More epileptiform fits succeeded during the same afternoon, each accompanied by rise of temperature to about 105°. In the evening he was much more conscious, the complete palsy of the right arm was very obvious, but there was no other paralysis. At about 5.30 A.M. on the 4th July, fits of the same character began again with a rise of temperature to 105°. From this time forth he remained comatose, and had a series of fits of convulsions with continued high temperature, till he died at about 8 P.M. on July 4th. Post mortem, he was found to have a patch of pneumonic lung at the right apex, the centre of the patch being gangrenous. Nothing abnormal was found in the brain, or vessels, or membranes. This I take to be a case of septicæmia, the focus of infection I take to be the gangrenous lung, the marked symptoms being coma, convulsions, rise of temperature, and *paralysis of the right arm*.

There are other cases of hemiplegia associated with apoplexy in which no lesion is found post mortem, and which cannot be regarded as epileptic, uræmic, or hysterical. Some of these, perhaps, are due to some organic disease which has escaped detection, especially if the vessels have not been carefully examined. Some may be due to anaemia of the brain or other disturbance of the cerebral circulation. I have, however, no experience of any value of such cases, and, therefore, prefer to say nothing more about them.

Now a few words as to diagnosis. Hysterical hemiplegia can rarely be mistaken if the points I have already alluded to be borne in mind.

*Epileptic hemiplegia* has to be diagnosed from : (1) hemiplegia and epileptiform convulsions due to some organic disease of the

brain ; (2) hemiplegia and epileptiform convulsions of uræmia and toxic conditions of the blood. In its diagnosis from the first condition, it seems to me that the chief points to be attended to are —

(1.) Its occurrence in subjects afflicted with *habitual* general convulsions and loss of consciousness, *i.e.* in epileptics.

(2.) It occurs after a fit, which may be of unusual severity and duration.

(3.) The absence of any other symptoms, especially of headache, vertigo, vomiting, optic neuritis, and other symptoms of cerebral tumour.

(4.) The absence of any paralysis in connexion with the eyes, of any history of syphilis, or anything leading one to suppose that we have to deal with syphilitic disease of the meninges, or with gumma of the brain.

Thus if an epileptiform seizure occur in a middle-aged man, who on regaining consciousness is found to be hemiplegic, and who has not been subject to epilepsy since childhood, it is probable that we have a case either of some tumour of the brain, or of meningitis of the convexity of the cerebral hemispheres, of some form of cerebral syphilis or of uræmia. Such a case would not be one of epileptic hemiplegia. But if, as in the case I quoted, we have a young patient, subject all her life to epileptic fits, in whom a very violent fit is followed by hemiplegia, which after a variable time disappears more or less completely, we probably have to do with a case of functional or true epileptic hemiplegia. The diagnosis of epileptic from hysterical hemiplegia is the diagnosis between epilepsy and hysteria. The diagnosis of epileptic from uræmic hemiplegia resolves itself into the diagnosis between epilepsy and uræmia. This is sometimes a matter of great difficulty, but if a reliable history can be obtained it will often assist a great deal. Thus if we can make out that the patient is an epileptic or that he is known to suffer from chronic nephritis, the diagnosis is much assisted.

If besides the coma, convulsions, and paralysis, we find evidences of chronic renal disease we can usually make the diagnosis ; but the mere presence of albumen in the urine without other symptoms is of no value, for it is a well-known fact that albuminuria may occur even to a considerable extent after

an ordinary epileptic fit. When coma is sudden, of high degree and accompanied by convulsions, the probabilities are that the case is one of epilepsy and not uræmia, but not certainly, and it is in those very cases where there is apoplectiform uræmia that hemiplegia occurs.

Examination by the ophthalmoscope may assist us. If we find the characteristic white patches of so-called albuminuric retinitis, we can have no doubt that the patient is suffering from chronic nephritis, and we therefore have presumptive evidence in favour of uræmia.

Very often the diagnosis cannot be made except by watching the progress of the case, and in some cases it cannot be made at all.

The chief conditions from which uræmic hemiplegia has to be diagnosed are, (1) The hemiplegia of cerebral haemorrhage, and (2) That dependent on some form of blood-poisoning.

Its diagnosis from cerebral haemorrhage is usually impossible, and the cases are thought to be cases of haemorrhage till the post-mortem examination disproves it.

The diagnosis of uræmic hemiplegia during life, if it is to be made at all, must depend more upon the general symptoms of the case than on those referable to the nervous system.

The *treatment* of uræmic hemiplegia is the treatment of uræmia. A strong purgative, such as a good dose of jalap, is the treatment usually adopted, and this, with measures to cause diaphoresis, is, in the majority of cases, all that can be done. I have used pilocarpine in gr.  $\frac{1}{2}$  doses with good results. Warm baths or vapour baths may be used. In most of the uræmic fits which I have had to treat, there has been great venous distension, the jugular and veins of the surface standing out as thick cords, and venesection has been used in such cases with benefit.

The treatment in the case of J. H., which we may call "toxæmic" hemiplegia, was chiefly directed to lowering the temperature by means of the wet pack and quinine in large doses.

II. In connexion with hemiplegia of "organic" origin, it is my intention to illustrate the principles of the diagnosis of the *seat* of the lesion and to touch upon the diagnosis of the *nature* of the lesion and *treatment*.

In an ordinary case of hemiplegia when there is more or less

complete paralysis of the lower parts of the face, the arm and leg of one side, the *seat* of the lesion cannot with certainty be further localised than that it affects some part of the intercranial motor tract of the opposite side of the brain. It is in what may be called "extraordinary" cases of hemiplegia that more can be done in the diagnosis of the seat of the lesion. This statement is illustrated by the following cases.

Organic hemiplegia is most frequently sudden in its onset, but it is sometimes gradual. Most of my remarks in this paper relate to cases of sudden hemiplegia. It is occasionally accompanied by sudden loss of consciousness, *i.e.* by true apoplexy. It is very frequently associated with coma coming on gradually or by an apoplectiform seizure preceded by some so-called premonitory symptoms, and it is often unaccompanied by any loss of consciousness.

Thus, then, there are three clinical varieties of sudden organic hemiplegia, though it is questionable to what extent the three conditions are pathologically distinct.

The majority of cases of sudden and complete coma are unaccompanied by hemiplegia. When this symptom is present the case is sometimes uræmic; sometimes no cause can be assigned, but most commonly it is a case of a large cerebral haemorrhage.

Let us discuss some of these conditions in connexion with actual cases.

Of cases of sudden coma with hemiplegia due to cerebral haemorrhage the following is an example:—

CASE V.—W. B., a night watchman, aged fifty-four, was in his usual health on the morning of May 30th, 1884.

He was seen by a policeman whilst walking in the street to stagger and fall, and on going to his assistance he was found to be unconscious. His head was drawn to the right side, and his right arm and leg were held stiffly and convulsed.

When admitted to the surgery about half an hour later he was deeply comatose, breathing was stertorous, his arms were flaccid and fell equally. Both his legs were convulsively rigid. The pupils were equal and contracted.

After admission he remained comatose and from time to time had convulsive stiffening of both arms and both legs.

About three hours later he was still profoundly comatose ; the arms were not now rigid ; nor were his legs. The right pupil was dilated, the left one being contracted. The arteries were felt to be atheromatous ; the heart's impulse was outside the nipple-line and forcible. The urine was of s.g. 1010, and contained some albumen. Whilst I was examining his chest at 9.15 A.M. his respiration suddenly ceased. His heart continued to beat for one minute longer and then suddenly stopped. (It was not a gradual cessation but a sudden one.)

This is a case in which we had more than coma and hemiplegia, and in this case I spoke with great confidence as to diagnosis, which was confirmed by the post-mortem examination. Here we have a case of contracted granular kidneys and hypertrophied heart proving fatal by cerebral haemorrhage. The haemorrhage had taken place primarily into the left corpus striatum, from which it had rapidly made its way into the left lateral ventricle (hence the case was primarily one of right hemiplegia with convulsive rigidity of that side). The haemorrhage, however, had not confined itself to the left lateral ventricles but had made its way into the right lateral ventricle (hence the extension of paralysis and convulsive rigidity to the other side of the body).

The haemorrhage had next proceeded down into the crus on into the fourth ventricle (hence the sudden cessation of respiration and of cardiac action).

This case is instructive in many respects. A cerebral haemorrhage is not usually associated with sudden and complete coma, but is usually more gradual. When a cerebral haemorrhage is rapidly fatal it is usually ventricular.

Early rigidity and convulsive attacks in the affected limbs are said to accompany ventricular haemorrhage and also cortical haemorrhage. The deep contraction of both pupils is said to indicate haemorrhage into the pons, but this case shows that it may accompany haemorrhage into the lateral ventricle.

Contraction of both pupils is in my experience not infrequent in ventricular haemorrhage. It was very marked in the next case, which is one in which hemiplegia was also accompanied by early rigidity and conjugate deviation of the eyes, with ptosis :—

CASE VI.—E. M., a man aged sixty-two, was brought to the surgery on June 4th, 1884, semi-conscious and hemiplegic. He

was known to have been in his usual health three hours before he was found by the police.

When admitted, his pupils were equal and much contracted. The head and mouth were drawn to the right side. He had ptosis of the *left* eyelid and conjugate deviation of the eyes to the *right* side.

The left arm and leg were paralysed and rigid. The supinator, triceps, and patellar tendon reflexes were exaggerated on the left side, and ankle clonus could be obtained.

The arteries were atheromatous. There was *no evidence* of hypertrophy of the heart. The urine was of specific gravity, 1018, and contained a trace of albumen.

He died after becoming gradually more and more comatose, and on post-mortem there was found a haemorrhage into the right corpus striatum and right lateral ventricle, and strictly limited to these places. The kidneys were in a condition of extreme granular contraction, but the heart was *not at all hypertrophied*.

The points of interest in this case are: contraction of both pupils, rigidity in the affected limbs, and ptosis of the eyelid of the paralysed side of the body, with conjugate deviation of eyes *from* the paralysed side.

Now, ptosis with or without conjugate deviation of the eyes in cases of hemiplegia is rare; it is unusual to have any affection of the eyes in hemiplegia, and when one does get an affection of the eyes it is more commonly of the side opposite to the hemiplegia, not of the same side as the paralysis.

Before discussing the bearing of this I will relate another case in which ptosis occurred, together with conjugate deviation of the eyes *towards* the side of hemiplegia.

CASE VII.—J. W., aged fifty-eight, has been addicted to drink, has had gout, gets up at night to pass water several times.

On May 19th, 1884, he had an apoplectiform seizure, coma lasting about twenty minutes. On regaining consciousness his left arm and leg were weak. His speech was thick, and his left eyelid was noticed to droop.

On admission on May 23rd there was ptosis of the left eyelid (*not complete*); his pupils were equal, and reacted to light.

There was conjugate deviation of the eyes to the left side. Movements of eyeballs were good, except towards the right side. Lower parts of the face on left side were paralysed. There was weakness of the left arm and leg, but the loss of power was very incomplete, and there was rigidity, with excessive reflexes.

His condition gradually improved, and on May 30th the ptosis and conjugate deviation of eyes were much less marked. The left eye moved well towards the right side, but the right eye only slightly beyond the middle line.

By June 10th his ptosis and conjugate deviation had gone, and he was discharged on June 28th with only a slight difference between the arms of the two sides.

The questions for discussion in this case are the causes of the ptosis on the same side of the body as the paralysis, and the conjugate deviation of the eyes to the paralysed side, and to enquire if these symptoms can throw any light on the diagnosis of the seat of the lesion. The case was probably one of cerebral haemorrhage.

To understand the pathology of these affections of the eyeballs one must have a clear idea of the physiology of their movement, and I have formed the following theory to elucidate this matter.

We all know that the movements of the eyeballs are extremely complex. When we look upwards, we do so with both eyes; when downwards, or to the right or left, both eyes are in action and move in that direction. One cannot look to the right or left with one eye and in any other direction with the other eye. This condition depends on some co-ordinating mechanism between the eyes of the two sides, whose object appears to be to preserve the normal relation between the optic axes. Experimental physiological research seems to show that this co-ordinating mechanism depends upon a co-ordinating centre situated in the corpora quadrigemina. There appears to be a centre there, connected with nerve-fibres from the optic, the third, the fourth, and sixth nerves, whose business it is to co-ordinate the various nerves together.

We further know that this centre must have some connexion by nerve-fibres with the seat of the will in the cerebral hemispheres.

These fibres we know decussate somewhere in their course.

Suppose then that we will to turn our left eye outwards, a stimulus must be supposed to pass downwards along the fibres in relation to the sixth nerve of that eye to the co-ordinating centre in the corpora quadrigemina. From this centre it is conveyed along the fibres connecting the corpora quadrigemina with the nucleus of origin of the sixth nerve, and from thence to the external rectus of that eye. But, in the corpora quadrigemina the sixth nerve becomes co-ordinated in its action with that part of the third nerve of the opposite side which presides over the internal rectus of that side. So that when we will to turn the left eye outwards, the right eye must also always turn inwards.

The movements of the external muscles of the eyeballs are moreover co-ordinated with the internal muscles, as is seen in accommodation. But, it appears that those fibres of the third nerve which supply the levator palpebræ superioris muscle have not such an intimate connexion with the other nerve fibres, for we can by an effort of the will bring into action *one* levator palpebræ superioris muscle without in any way affecting any other muscle of either eyeball.

Suppose, then, a case in which a cerebral lesion were such as to affect the motor tract in the substance of the right hemisphere and also to involve the fibres in relation to the third nerve of that side, the effect would be a left hemiplegia, ptosis of the left eyelid, paralysis of those muscles of the left eyeball supplied by the third nerve. The sixth nerve of the left side being uncompensated in its action, there would be external strabismus of the left eye. But in the corpora quadrigemina, this action of the sixth nerve would become co-ordinated with the third nerve of the right side. Hence the result would be conjugate deviation of the eyes to the left side, left ptosis and left hemiplegia. This is precisely the condition that occurred in Case VII.

Considering this to be the correct explanation of conjugate deviation of the eyes, I should say with confidence that the lesion in this case was in the right cerebral hemisphere, *above* the corpora quadrigemina, and I do not consider that a lesion in the crus could explain his condition.

This theory also serves to explain Case VI. In this case there was marked rigidity with excessive reflexes of the affected limbs. This early rigidity I take to be a sign of irritation. There is thus some evidence that the lesion in this case was an irritative one. Suppose there to be such an irritative lesion in the right cerebral hemisphere such as to affect the fibres of the third nerve as well as the ordinary motor tract, the effects would be left hemiplegia with rigidity, left ptosis, excessive action of the muscles supplied by the third nerve, viz., contraction of the pupil and internal strabismus of the left eye.

But in the corpora quadrigemina, contraction of one pupil would be co-ordinated with contraction of the other pupil, and internal strabismus of one eye with external strabismus of the other eye. Hence there would be contraction of *both* pupils and conjugate deviation of the eyes towards the *right* side.

This is exactly the condition which was found in Case VI. and the lesion, post mortem, was found to be a haemorrhage into the right lateral ventricle without much destruction of cerebral substance—just the condition one would expect if my theory be correct.

In connexion with this very interesting and difficult question I will relate a third case in which there was convulsive conjugate deviation of the eyes first towards the paralysed side and afterwards deviation from the paralysed side :

CASE VIII.—J. D., aged seventy-four, had an apoplectiform seizure on April 26th, 1884, and was brought to the hospital.

On admission he was comatose, pupils equal and contracted, he had left hemiplegia, with more or less constant convulsive twitching of the muscles of the left arm and leg. The muscles of the left side of the face were also undergoing spasmodic twitching movements, also the left eyelid. The head was spasmodically deflected to the left and there was convulsive conjugate deviation of the eyes to the left.

During the night the convulsive attacks became less frequent until on the morning after admission there were only occasional attacks of rigidity.

By the evening of the day after admission the rigidity had ceased. He was comatose. The pupils dilated, head and eyes deviated to the right side. He died this evening. All the

symptoms of this case can be explained on the supposition of a lesion at first of an irritative character, afterwards leading to paralysis; and involving the motor tract, as well as the fibres, in connexion with the sixth nerve and with that part of the third nerve which has to do with the supply of the levator palpebræ superioris. Suppose there to be such an irritative lesion in the right cerebral hemisphere, it would, on my theory, cause left hemiplegia with convulsive movements; convulsive movements of the left eyelid and convulsive conjugate deviation of the eyes to the left side. This is what occurred in this man. Then suppose the lesion to become a paralytic one we should have cessation of the convulsive movements, left ptosis and conjugate deviation of the eyes to the right side. This, with the exception of the ptosis, which I did not observe in his case, is the condition that occurred. On my theory where must the lesion be? In some part of the right cerebral hemisphere; and there it was found post mortem. It was a case of a small cerebral haemorrhage into the right corpus striatum, succeeded by softening of the white substance of the cerebral hemisphere outside and in the right corpus striatum.

In my experience conjugate deviation of the eyes is either extremely transitory or more or less permanent, and I believe it to be a symptom of great value in diagnosing the seat of the lesion.

It means that the lesion is always in the cerebral hemisphere above the corpora quadrigemina.

Equal contraction of both pupils is said to indicate haemorrhage into the pons; but in my experience it is equally frequent in haemorrhage into the lateral ventricle.

“Early rigidity,” according to current opinions, is found in (1) cortical haemorrhage or other cortical lesion; (2) ventricular haemorrhage; (3) cerebral softening; (4) when there is much laceration of brain substance.

I do not think that the seat of the lesion has much to do with early rigidity, but rather its nature and extent. However, in my two cases of ventricular haemorrhage it was present. In one case of cortical haemorrhage it was absent. In the case of cerebral softening which I related it was present at first and almost of a convulsive nature, but disappeared after a time.

I take it that early rigidity means irritation, and this seems to me to depend on the nature and extent of the lesion. A haemorrhage taking place rapidly would soon lead to a complete rupture of nerve-fibres and therefore the period of irritation and early rigidity, if present, would be short. Hence in the majority of the cases it is not seen by the physician.

Hemianæsthesia, when complete, *i.e.* affecting the special senses, as well as cutaneous sensibility, is a valuable sign and is said to indicate a lesion of the thalamus opticus. But if the skin only is insensitive, the symptom is very transitory and of no value.

Aphasia associated with right hemiplegia is a sign the value of which is now fully recognised.

The diagnosis of the *nature* of the lesion depends upon the mode of onset of the hemiplegia, whether sudden or gradual, whether accompanied by apoplexy or not. It also depends in a great measure on signs apart from the nervous system—*e.g.* signs of heart disease or of granular kidneys; and the presence or absence of vomiting, headache and optic neuritis—the signs of cerebral tumour—is of much value.

The *treatment* of hemiplegia depends greatly on the nature of the lesion, but even when this is well known comparatively little can be done.

For hemiplegia due to softening nothing can be done, beyond attending to dieting and nursing, and administering tonics and such-like remedies; and hoping that a certain amount of reparative change may occur.

When due to syphilitic disease of vessels succeeded by thrombosis, a condition rendered probable by hemiplegia of gradual onset in a young adult, preceded by other cerebral symptoms and following a definite history of syphilis, with the absence of any history or symptoms pointing to some other cause, large doses of iodide of potassium should be employed.

This may be used in combination with liq. hydrarg. perchlor. I have seen cases of hemiplegia recover under this treatment.

In cases of cerebral haemorrhage, the primary apoplectic state requires some treatment, but beyond nursing and diet, with a strong purgative of calomel, jalap or croton oil, little can be

done. The question of venesection may arise, and I have known this to be followed with apparently good effects.

When due to cerebral tumour, treatment is useless unless one can so far localise the seat of the tumour as to feel justified in recommending the operation of trephining, with a view to its removal.

When hemiplegia has become chronic, the condition of the paralysed limbs may often be improved by the continued daily employment of shampooing, and galvanism or faradism ; but no treatment is of any avail if the condition known as "late rigidity," due to descending degeneration of the lateral columns of the spinal cord, has set in.

In conclusion, I have to express my thanks to Dr. Gee, Physician to St. Bartholomew's Hospital, for his kindness in allowing me to make use of the cases of hemiplegia occurring in his wards during my period of office as his House Physician.

## TINCTURE OF IODINE IN DIPHTHERIA.

BY EDWARD ADAMSON, M.D., EDIN.

IN consequence of the sad results of several cases of diphtheria, treated after the usually prescribed methods, I tried, some five years since, to find some remedial agent or other which, in addition to its own proper therapeutical value, might exert topically upon the fauces, &c., a medicinal and even antiseptic action; and hoped that thus by frequent dosage and repeated medication the diphtheritic lesions of the throat might be effectually and successfully attacked.

After one or two failures with potassium chlorate, it occurred to my mind that the internal exhibition of the pharmacopœial tincture of iodine, given very frequently and in moderate doses, would probably have the desired effect; and after many trials I have found that the iodine, thus taken internally in a liquid form, may be thoroughly relied upon, in order to promote the separation of exudative membranes, to check the formation of new exudations, to lessen the secretion of viscid offensive saliva, to destroy the vile foetor of the breath, and, in fact, generally to correct the morbid condition of the fauces, tonsils, &c. Within thirty-six hours a marked improvement *in every respect* is noticeable, which is generally perceptible even to the patient, so that there is often an eager desire to accelerate the frequency of the doses of the iodine.

Out of fifty-five cases of diphtheria thus treated with tincture of iodine alone—and some very grave cases indeed—fifty-three recovered without any troublesome sequelæ whatever. Of the two fatal cases (both children of eleven to twelve years), in only one did the iodine *seem* to fail. However, a mortality of less

than thirty-seven per 1,000 in so serious a disease as diphtheria induces me to mention to you thus cursorily the above results.

I have to add that the doses for adults were five to seven minims every hour, or every two hours, according to circumstances ; and for children of six years to twelve years, two to three minims taken every two hours in syrupus aurantii  $\frac{3}{3}$ iii and water, or in some other neutral syrup. In short, the addition of some agreeable excipient to the nauseous tincture of iodine is worth consideration in *all* cases, and for this purpose the syrup of quince (*vide Practitioner*, February 1881) is peculiarly suited.

## ON THE TREATMENT OF DIPHTHERIA.

BY H. KURNANDER.

*Surgeon P. and O. Company's Service.*

IN my opinion, if a case of diphtheria is taken in time it is generally perfectly amenable to treatment, but treatment must be constitutional as well as local; and the disease being essentially zymotic, antizymotics must be ungrudgingly had recourse to. In a series of ten cases which I have treated I began with a nauseating emetic<sup>1</sup> (*antimonium tartaratum*) so as to equalise the excited circulation and modify febrile symptoms. This is contrary to Dr. Bristowe's advice given in the second edition of his *Theory and Practice of Medicine*. The bowels were also cleared by a good purgative (*mist. sennæ co.*). Neutral salines were then given. At the same time the strength of the patient was maintained. For this end the best possible formula was found to be a mixture of liq. ammoniae acetatis and tinct. ferri perchloridi, to which were added free doses of potassii chloras, so as to affect the skin, oxygenate the blood, and keep up the strength, a diffusible stimulant being added as circumstances required. The sick room was impregnated with the vapours of creasote, though carbolic acid or Condyl would answer equally well, and thymol is an excellent and agreeable substitute. My patients at the same time drank a weak solution of hypophosphite of soda, rendered pleasant to the taste by the addition of a little syrupus aurantii and ice, of which they partook freely so as to get twenty or thirty grains per diem. To others I ordered a drink acidulated with sulphurous acid instead, it being powerfully antizymotic and antisepctic. Small pieces of ice were also allowed

<sup>1</sup> It is important to select your emetic carefully and not give any one at haphazard.

to be sucked *ad libitum*. As to local medication I must deprecate *in toto* the application of caustics and irritants to the throat, though I am aware they are recommended, and some use nitrate of silver and nitric acid, or even tear away the false membrane. Here a weak gargle of sulphurous acid or chlorinated water is much to be preferred, and a very excellent and comfortable gargle is about one-third of liq. calcis with two-thirds of milk and some glycerine of carbolic acid, about two drachms to the half pint. It dissolves and loosens the diphtheritic secretion, is most comforting, and prevents the spread of contagion from the latter, both locally and generally, acting as antiseptic, antizymotic, and disinfectant, and it will do no harm if swallowed, but rather good. Where the disease is far-advanced, and has to any extent invaded the larynx, or has been neglected (as in two cases that came into my care in that condition) there can be but little chance for the patient; and here perseverance in the same remedies, only more vigorously employed, with antiseptic spray to the larynx, produced marked benefit. In these two cases the prognosis was certainly not favourable. In one of them there was invasion of the naso-oral and laryngo-tracheal tracts, and the patient, an adult, suffered simultaneously from haematuria, and was *in extremis* on my first visit to him.<sup>1</sup> Assuming a severer state of things for the patient it must be clear that all one could do would be only to persevere in the same line of treatment even more vigorously, and to resort to tracheotomy to gain a little time. This very simple operation has rarely done good in diphtheria, and this has been so because the operation has been delayed too long, thus allowing extension of the lesion into the larynx, the trachea, and even the bronchi. I am almost of opinion that even here, were the atmosphere of the sick chamber to be "poisoned" with an antiseptic before, during, and after the operation, a result might be recorded better both for the patient and the interests of tracheotomy. I believe the experience of operators will attest the validity of this statement. I certainly would not hesitate to operate to-morrow if my patient's (diphtheritic) condition were to need it. But I should not content myself with regulating the temperature

<sup>1</sup> In this instance emesis was clearly contra-indicated. It was not, therefore, had recourse to.

of his room—that is quite necessary—but I would charge the air the patient has to breathe with an efficient antiseptic. Convalescence was treated by tonics and attention to nutrition. And even in this stage my experience has taught me to keep on with antizymotics though the patient apparently may not require them. Spite of all one can do the patient may die from asphyxia rapidly; or he may die early from shock on the system produced by blood-poisoning; or he may die in a more lingering case from asthenia. But come what may, the rigid adoption of an antizymotic method of managing diphtheria as detailed in this paper and perseverance in it for a considerable period afterwards are imperative. In two ill-nourished subjects without tone where the extent of the mischief was decidedly extensive, and adynamia coexisted to an alarming degree, I had recourse to quinia, wine and brandy, to support the powers of life. These patients suffered from extreme pain of the muscles of the pharynx, neck, and tongue, accompanied by difficulty of swallowing and difficulty of articulation, followed by bulbar paralysis. They were successfully treated by nervine tonics, with nervine sedatives, and by hypodermic injection of calabar bean, and locally by derivatives in the form of stimulating liniments. The severe pain was effectually combated by the local application of linimentum belladonnæ and liquor atropiae in equal parts.

My cases were genuine diphtheria without the shadow of a doubt; but by the plan of treatment above advocated all my cases, ten in number, made good recoveries.<sup>1</sup> Having made a point of seeing them about a year later, they were in as good health as ever they had been before their illness, and some of them were even robust.

<sup>1</sup> With one exception, viz. the moribund patient referred to in the text.

## DIPHTHERIA AND PARALYSIS.

BY CHARLES R. FRANCIS, M.B.,

*Surgeon-General H.M.I.A.*

THE following notes of a case of diphtheria may be interesting from the care with which the symptoms are recorded, occurring as they did in the person of the observer, who was himself a medical man. Some points which are worthy of note are the curious retardation in the perception of heat noticed on July 9th, and the great rapidity of the pulse noticed on August 8th. There can be little doubt that this exceedingly rapid pulse was due to paralysis of the inhibitory function of the vagus nerve, which has been described by Leyden as occurring after diphtheria.

On June 23rd, 1883, Dr. A. was painting the throat of a child suffering from diphtheria, and, during the operation, the child coughed in his face, on which he distinctly felt moisture to fall. The doctor washed his face immediately and dried it carefully.—On the 24th, Dr. A. felt very feverish and had several rigors, but there were no throat symptoms.—On the 25th the throat felt sore on waking in the morning, and a large white patch could be seen on the right tonsil. This increased rapidly during the day. Argent. nit. grs. xx. ad  $\frac{1}{2}$ i. applied ter die. Tonsils enlarged.—(26th) Swelling of tonsils was increasing, but the membrane was stationary. Argent. nit. continued.—(27th) Throat improving; which improvement was, for a time, maintained. Swallowing painful, but not difficult.—(July 4th) Paralysis of throat began to show itself. Swallowing still painful, and fluids came through nose.—(9th) General health very much improved. Able to see patients. Swallowing no longer painful, but very difficult. After taking a mouthful of food and thinking it had all gone down, an attack of choking would supervene from some of the food not having been swallowed. Possibly some particles found their way into the larynx. On

one occasion he swallowed a very hot piece of potato, and, some minutes afterwards, felt a burning sensation all down the œsophagus; though, at the time of swallowing, he had felt nothing.—(16th) General health improved, but throat "*in statu quo.*"—(30th) Condition the same.—(August 12th) Eyesight began to fail. Could see distant objects fairly well, but reading was impossible: the lines appeared to be doubled and the letters seemed blurred and as if running into one another.—(18th) Had become very weak. Pulse 135, and very feeble. Eyesight and throat "very bad."—(20th) Went away for change.—(August 23rd) Improving rapidly. Eyesight much better. Could drink fluids slowly, but solids were swallowed with difficulty.—(25th) Swallowing very much better. Sight so much improved that he could now shoot birds flying. But his legs would sometimes suddenly fail him. This occurred once when he was on the bank of a river and he with difficulty got back to his conveyance.—(September 2nd) Legs becoming weaker, and hands now commenced to be useless. What first drew Dr. A.'s attention to this was the inability to button his trousers; in trying to get a knife or pencil out of his waistcoat pocket he could feel that he had hold of something, but what it was he could not tell.—(20th) Could hardly walk. Unable to write. Totally unable to dress or undress himself. Sensation, especially in lower limbs, almost entirely absent, as also from hands and arms, but less (September 20th) completely. Anæsthesia, too, in trunk, but in a still minor degree. In all other respects "felt very well." Excellent appetite. From the middle of August had been taking quin. sulph. gr.j., tinct. ferri perchlor. ℥ xv., liq. strychniae ℥v., gradually increased to twice the quantity of the iron and six times that of the strychnia ter die.—(Oct. 1st) Much the same. Tetanic twitching suddenly in the afternoon in fore-arms and legs, passing off in two or three hours. Strychnia discontinued, faradisation commenced.—(20th) Very gradual but decided improvement; locomotive power, however, very limited. Faradisation and cold shower-baths ultimately completed the cure.—(December 1st) Well. Able to play lawn-tennis again.

The urine was first examined for albumen ten days after the commencement of the illness, and subsequently, at intervals, for

two months; but none was ever discovered. There was a well-marked nasal twang, which continued for quite three months. Control of the voice was very imperfect. At the end of six months he could hardly sound a note on attempting to sing; though, when speaking, no alteration in the voice was detected. During these six months he could not shout. On one occasion, on attempting to do so—he was out in the country in a waggon and wanted to call together the boys who were some distance off—no sound was made.

With the exception of a few days towards the end of the second month there was but little feeling of debility, or depression, throughout. At this time, however, the action of the heart was very feeble; the pulse, too, being 136, small, and easily compressed. The patient, a young man with excellent physique, soon improved, however, after a short change into the neighbouring country.

Fortunately there were no dyspeptic complications, the appetite and digestion being good from first to last. Vomiting supervened, occasionally, upon the violent fits of coughing, which sometimes occurred during attempts to swallow—due, probably, to particles of food finding their way into the larynx. Being unable to drink fluids with freedom, there was always an intense longing for “a good drink.”

There was no abrasion on Dr. A.’s face, and he was careful to wash and wipe it thoroughly immediately after the child had coughed into it. The poison was doubtless inhaled; and we see in this fact the importance of keeping as much as possible out of the way of a patient’s breath when dealing with an infective throat. An antiseptic piece of gauze, made to fit over the nose and mouth, would, doubtless, have intercepted the inhalation. The virulence and subtlety of the poison of diphtheria quite justify our taking every precaution to prevent its entry into the system. It is interesting to note its halting progress through the body. Attacking, first, the throat (which seems, moreover, to have suffered the most) it fell, between five and six weeks afterwards, upon the eyes. Then, at the end of another fortnight, it appeared in the lower extremities, and, a week later, in the upper; visiting the trunk last before its final disappearance from the system.

## SHORT NOTES ON THERAPEUTICS.

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(Continued from vol. xxxiv. p. 417.)

### OCULAR THERAPEUTICS.

Most important in considering the action of mydriatics and myotics are the conclusions of Brailey, which I think it well here to summarise, in regard to primary glaucoma—(a) that as inflammation of the ciliary body, iris, and optic nerve is one of the earliest, so it is one of the most constant of the symptoms of primary glaucoma; (b) that this condition is accompanied by vascular turgescence of the ciliary folds and dilatation of the arteries of the ciliary body, to be followed at a later stage by atrophy of the ciliary muscle and resulting connective-tissue formation; (c) that the iris periphery is nearly always advanced and applied to the cornea, and lastly, that it is these pathological conditions which, through hypersecretion from the ciliary body and iris, and obstruction in Schlemm's canal, cause the intraocular hypersecretion and increase of tension. Also, as bearing on this question of the part taken by the iris and its vessels and the vascular changes in the ciliary body, it is equally necessary to remember the large number of glaucomas which arise from wounds in the sclero-corneal region, involving either the iris, with consequent entanglement of its fibres, or the ciliary body, folds and muscle, with consecutive swelling, atrophy and sclerosis, or the circumference of the lens with the escape of some lenticular particle, and encroachment on the circumlental space from subsequent enlargement, and resulting synechiae.

From these few observations we can estimate the discrimination and judgment demanded in the resort to mydriatics and the mischief that their indiscriminate use or injudicious application may produce: remembering that, in the use of mydriatics, whether we have to deal with primary inflammatory conditions or the secondary consequences of wounds, we, more or less, contribute to the increase of all those earlier departures from the normal state which tend to produce the ultimate complication we so much dread, and which it is our object to avert. Nor must the idea of Donders and others be lost sight of, that intraocular hypersecretion may result from peripheral irritation of the fifth nerve. The various nervous influences that operate to bring about increase of tension are not so clearly differentiated that we can overlook any possible action of a mydriatic in this direction. As the result of the local action of atropine and duboisine we are aware that certain direct physiological effects follow, and that these are liable to produce, if continued in the face of predisposing influences, temporary or permanent pathological changes in the circulatory channels of both the blood and lymph.

Those primary physiological effects are—(1) Oculo-motor peripheral paralysis; (2) vaso-motor peripheral stimulation; (3) retraction of the iris with consequent encroachment on the filtrating spaces; (4) congestion of the tissues and vascular area which are included in the ciliary zone—ciliary body, ciliary muscle, ciliary folds, the spaces of Fontana and Schlemm with their trabecular tissue; (5) an alteration, relatively, from its normal distribution, of the blood supply in the iris, the vascular area referred to, the ciliary folds and choroid tunic, with a corresponding change in the calibre and tension of the blood-vessels; (6) encroachment on the corneo-iritic angle, with attendant change in the shape and dimension of the anterior chamber and peritelantal space; (7) obstruction to the circulation, with partial stasis of fluid in the canal of Schlemm; (8) cessation of the act of accommodation, and the resulting movements of the lens and entire accommodative apparatus, while the free admission of light and of the circumferential divergent rays when looking at near objects produces blurring and confusion of such images, with associated retinal distress, and, unless such

free access of light be neutralised by tinted glass, injurious stimulating effects on the retina, especially in irritable and congestive states of this membrane, are the possible, if not probable result. It is also of importance to remember that atropine or duboisine are held in solution in the aqueous humour (Donders), and sufficiently so to produce the characteristic physiological effect when the atropised aqueous humour is applied to an eye. Thus, a permanent action is maintained through the atropised aqueous, which is in extent increased in proportion to the strength of the solution and the frequency of application.

From these considerations we can realise the necessity for caution in the application or prolonged use of a mydriatic in such affections as the following, (a) primary glaucomatous states ; (b) injuries of the ciliary region such as punctured and incised wounds or contusions ; (c) peripheral wounds of the iris with or without entanglement of the iris in the wound ; (d) after traumatism of the lens with swelling of the capsule or escape of lenticular matter ; (e) cyclitis ; (f) sclero-choroiditis anterior ; (g) marginal perforating ulcer of the cornea, Sæmisch's ulcer, rodent ulcer, corneal cicatrizations ; (h) old parenchymatous adhesion of the iris attended with irido-choroiditis and irido-cyclitis ; (j) retinal hyperæmic conditions, retinal hæmorrhage, subretinal effusion, detachment, optic neuritis and papillitis. In some of these atropine or duboisine may be used tentatively at first, to form a diagnosis, to secure rest, and relieve pain, and of the two I lean to the side of duboisine, as more certain in its action, less irritating to the eye, and not requiring such frequent application. But in continuing the employment of either, I believe we run in nearly all of these states considerable risk. For some years past my resort to atropine or duboisine has been mostly confined to the following affections and accidents—(a) conjunctival inflammation, (b) corneitis, (c) corneal ulcers, superficial and central, previous to and immediately after paracentesis of the latter, (d) parenchymatous iritis and specific iritis, (e) recent synechia (anterior or posterior), (f) in injuries—for purposes of diagnosis, and for some time after the occurrence of corneal wounds to relieve pain and protect the iris, (g) in certain cases of cyclitis and anterior sclerotico-choroiditis in which *periodical* resort to a mydriatic

has relieved pain and reduced congestion, and in which eserine was not tolerated, (*f*) after injuries of the lens, (*g*) acute retinitis, (*h*) anomalies of refraction and spasm of accommodation.

In many instances in which atropine has been employed I think cocaine may now be with advantage substituted for it; as for example in conjunctival and corneal inflammations. We have the great additional gain of the local (peripheral sensory) anaesthetic effect added to the mydriatic (peripheral sympathetic) influence. This is well exhibited in the ordinary photophobia and pain of phlyctenular conjunctivitis and in corneal ulcer. I yesterday removed a spicula of glass, so fine that it required a lens to see the particle on removal, which was imbedded for a fortnight in the corneal cement. The eye was severely cut by the glass of a concave lens (spectacle) which was broken on the face and some pieces were removed at the time. The sclerotic wound healed, but the little corneal gap refused. It was most difficult to decide if any very minute particle of glass remained either by objective or ophthalmoscopic examination. With Mr. Streatfeild, I determined to employ cocaine, and with a fine probe of wire to search the wound. The patient was a nervous and fidgety lad. I detected the gritty particle and with the probe-point of a Weber's canaliculus knife I removed it. Though the eye was very sensitive before this, he complained not in the least of the manipulation. I merely mention this case, occurring as I write this paper, to illustrate the practical advantage, now so widely known and so fully written on, of cocaine. So in the pain of corneal ulcers and iritis, and in cases in which there is severe periodical pain of a neuralgic character in iridocyclitis, and after injuries, cocaine can with advantage be substituted for atropine.<sup>1</sup> As is well known, some patients are most

<sup>1</sup> In the interesting and original communication on Cocaine by Mr. Walter Jessop in the *Practitioner* of January 1885, the peculiar physiological effects of this mydriatic were fully entered into—viz. (*a*) increased corneal flaccidity; (*b*) slight laerimation (due to displacement of the pupilla); (*c*) enlargement of the palpebral aperture (due to retraction of the eyelids from contraction of Müller's muscle); (*d*) contraction of the peripheral vessels and ciliary arterioles. The response of the iris to weak solutions of cocaine may be readily availed of to assist in the diagnosis of those cases of oculo-motor disturbance with slight inaction of the pupil or inequality due to an irritative or paralytic myosis or mydriasis associated with cerebral or spinal-cord lesions or injuries. I saw, a few days since, a case of suspected cord injury in which I found the pupils reacted to

intolerant of the use of atropine. It produces a persistent catarrhal conjunctivitis and folliculitis with attendant swelling of the eyelids. This condition is accompanied by redness, and at times, an eczematous eruption, which recurs on each occasion when the atropine is reverted to. I have not found this result with duboisine. This effect does not depend on any impurities in the atropine. I have found it more frequently in old cases of iritis in which atropine had previously been employed for some time and its long continued application was followed by this follicular hypertrophy. In such cases it may be well to substitute homatropine, cocaine, or duboisine. In estimating astigmatism cocaine has the advantage of securing full paralysis of accommodation (20 per cent. solution) with comparatively rapid subsidence of the paralytic effect. I have seen on some occasions an erysipelatous swelling extending to the temple ensue from the use of atropine; I have rarely witnessed any toxic effects after its application, and nearly always it has been in the instance of children. Once the full mydriatic effect of atropine is produced its too frequent instillation appears to me to be a mistake. Slight dryness of the throat I have often seen, but it has only been on a few occasions that I have resorted to the subcutaneous use of morphia as a precautionary measure from the appearance of any unpleasant symptoms. It may be well, as Wecker recommends, in cases of this kind to make pressure on the lacrimal sac during and for a little time after the instillation. I cannot help feeling, from my experience, that in those cases in which unpleasant constitutional effects have resulted from atropine that the cause might be found in too strong a solution and too frequent or prolonged an application. Duboisine, as a more powerful mydriatic, has to be used with greater caution. Still it yields better results than atropine in many cases and has a greater

light and on convergence but unequally, the slight sluggishness of the left pupil not being sufficiently pronounced to found any opinion on. After fifteen minutes I examined both eyes ophthalmoscopically under a 4 per cent. solution of cocaine, the left pupil was then fairly *dilated*, the right only partially. I found the left papilla in a hyperæmic condition, the right normal. The following day the right pupil had returned to its normal size, the left still remaining (though reacting to light) in a partially dilated state, with slight irritation, mydriasis being increased by the local action of the cocaine on the sympathetic.

effect in controlling pain, while its action on the pupil is more lasting than atropine. It will occasionally dilate the pupil and break down synechiae where atropine fails, and has the great advantage that it is not so liable to be followed by irritable conjunctiva. The exceptional physiological action of duboisine when it is instilled into the eye is well illustrated by the following case.

A lady for whom the writer had prescribed a mild solution of atropine to dilate the pupil for obscured vision, caused by slowly forming cataract, began to suffer from some of the unpleasant physiological effects, as dryness of the fauces and dysphagia. Her son, a medical man, determined to try duboisine and ordered a half per cent. solution, no atropine having been used for some time. At ten o'clock at night two drops of a solution were put into one eye and one drop into the other, (afterwards it was ascertained that a much stronger solution than the one ordered was given by the chemist). In fifteen minutes the pupils were dilated to the maximum degree. In thirty-five minutes from the application of the drug, the patient having in the meantime retired to bed complained of the following distressing symptoms: absence of saliva, dryness of the fauces, inability to swallow even a small bit of semi-masticated biscuit. This was succeeded by a sensation of vertigo and muscular weakness, staggering on the attempt to stand or walk, and was followed by (what her son described as) a "dazed state" and a slight attack of vomiting. The only restoratives at hand were some mustard stups, aromatic spirit of ammonia and strong tea, all of which were used. With sleep which came in a few hours, these symptoms subsided, leaving her the next day with only a slight dryness of the throat, and some difficulty of swallowing. I have had no cases of such trouble myself after the use of duboisine, and therefore I think it well to record this one of my friend's, as it well shows the effects that may follow the exhibition, even in small quantities, of this alkaloid. I have never had any delirium or head symptoms after the instillation of gelseminine; but then I have only used a weak solution for ophthalmoscopic purposes and it has not been repeated in the same persons on frequent occasions. It answers for ophthalmoscopic examination admirably, its mydriatic effect being comparatively transient, passing off within

twenty-four hours. But its place has been taken by homatropine (Tweedy), which has all its advantages and none of the unpleasant effects which have been occasionally noticed with gelseminine. We may now contrast with these mydriatics the advantages in ophthalmic practice of the myotics eserine and pilocarpine.

The salts I have the longest experience of are the sulphate, hydrobromate, and salicylate of eserine (physostigmine) and the muriate of pilocarpine. I use now entirely the salicylate of eserine. It is the most stable of the salts of that alkaloid and may have a slightly antiseptic action. This, however, though for some time I deluded myself with the belief in the antiseptic properties of eserine, if they at all exist, must be hardly worth taking into account therapeutically, as I find that all the salts of the alkaloid, when added to organic solutions, rather advance than retard decomposition—the only one apparently not having this effect being the salicylate. If we contrast the primary physiological effects of physostigmine or pilocarpine with those of atropine and duboisine we find them as follows :—

(1) Oculo-motor peripheral stimulation ; (2) vaso-motor peripheral paralysis ; (3) contraction of the pupil with consequent advancement of the iris and relief of pressure on the filtrating spaces ; (4) greater freedom for the circulation in the vascular area which includes the ciliary body, folds and muscle, the spaces of Fontana and Schlemm ; (5) diminution in the tension of the blood-vessels in the iris, the vascular area, and adjacent choroid ; (6) increase in the corneo-iritic angle, diminution of pressure in the marginal vessels of the cornea ; the anterior chamber becoming shallower ; there is greater room in the perilental space ; (7) cessation of the act of accommodation with the accompanying movements of the lens and entire accommodative apparatus ; (8) the admission of the rays of light both from distant and near objects is reduced to a minimum, and the stimulating effects of light on the retina are obviated by the intervention of the iris ; this is specially to be desired in irritable and congested conditions of the retinal tunic ; (9) through its absorption into the aqueous humour its action on the entire arterial supply of the globe is sustained and the blood supply regulated by a more evenly distributed pressure.

*(To be continued.)*

## THE NATURE, PREVENTION AND TREATMENT OF MALARIAL AFFECTIONS.

BY CORRADI TOMMASI-CRUDELI,

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THE following paper is practically the address delivered by Professor Tommasi-Crudeli before the International Medical Congress at Copenhagen, 1884, and contains a brief summary of his own studies, and the present position of the question from his own point of view.

He begins by saying that it will, in his opinion, be useful to review the whole matter, and consider what is really known on the subject up to the present time.

He then proceeds to define the terms he intends to use, viz., "*malaria*" and "*terreni di malaria*," instead of "*miasma palustre*" and "*terreni palustri*," objecting to these as being the terms used by other authors to express what he now considers to be a thoroughly exploded idea, viz., the necessary connexion between malarial fevers and marshes or marshy soils, declaring this idea to be a totally false one. His first mention of the possible cause of malarial fevers involves the use of the phrase "specific ferment," the which he declares *not* to be of exclusively palustral origin, and still less to be the product of putrefactive processes. He then goes on to state "that in every part of the globe situate between the two polar circles, there are marshes, stagnant waters, waters in which flax and hemp are macerated, and places where the mixture of fresh with salt water takes place on a vast scale, and which are not malarious; whilst there are others which are not and never were marshy, and where there is no trace of putrefactive processes, which are malarious in the highest degree." He then goes on to state that malaria exists on soil of every conceivable variety and of every age in geological time, and that it

is impossible to point to any mineralogical or chemical condition of the soil which can be said to be essential. From this he argues that all soils have become infected, so to speak, and he defines the word malarious as expressing a soil or locality infected by "*the malarial ferment.*"

He then declares it to be his intention not to go deeply into the question of the existence of "the ferment," inasmuch as "the experiments relating to it are not yet complete." The idea that intermittent fever was caused by some minute organism is, he says, as old as Varro, and that independently of the reasons which induced Rasori, and later Henle, to adopt the notion of *contagium vivum*, and before the microscope revealed the actual existence of organisms there were circumstances which pointed to the idea even in very remote times.

He next turns to consider the possible chemical origin of the poison, and asks how such an origin is possible seeing that the poison remains the same in all malarious places, no matter what may be the composition of the soil. So long, he says, as the notion of the "*pregiudicio palustre*" prevailed, the chemical origin of the poison was admissible, but seeing that malaria exists on soils of the most diverse composition, "*the persistent identity of the product is chemically impossible,*" whilst on the hypothesis of a "ferment," which finds suitable conditions for its existence in every variety of soil, the wide distribution of the disease is readily explained.

He then goes on to discuss the undoubted aggravation of the intensity of the poison "*in malarious soils abandoned to themselves.*" The history of Italy is full of such examples, there can be no doubt, says the author, that many Greek, Etruscan and Latin cities were founded and rose to a great pitch of prosperity in the midst of malarious districts. This, he says, was due to the energy of the inhabitants, who by incessant labour reduced the malaria to a point at which it became endurable, and by the continuance of the works of improvement succeeded in keeping it down, without, however, suppressing it entirely. When these cities and the drainage and other works were abandoned, the malaria again got the upper hand, and increased to such an extent that they were no longer habitable. There are places in the Roman Campagna, in which, even in times not very distant

from our own it was possible to pass the summer, and which now are utterly uninhabitable. In some of these at least the physical condition of the soil has not sensibly changed for centuries, so that the great increase in the intensity of the malaria cannot be attributed to a progressive alteration in the chemical composition of the soil sufficient to produce a yearly increasing quantity of noxious chemical products. Again, he says, on the "ferment" or "living-organism hypothesis," these relapses can be readily explained.

The localisation of the disease he thinks cannot be explained in any other way than on the hypothesis of a "ferment," for if chemical in its origin it should reach its maximum of intensity at that time of day when the sun is hottest and the activity of chemical processes is known to be greatest, whereas, the reverse is really the case. The risk of acquiring malarial fever is greatest at sunrise and sunset, *i.e.* when the difference between the temperature of the soil and the superjacent strata of the atmosphere is greatest, and the vertical currents are, as it were, at a maximum. Assuming the poison to be particulate there is no difficulty in understanding that these particles would be most abundant in the lower strata of the atmosphere at these two periods of the day.

All these arguments, which he says admit of easy verification, tend to show that the malarial poison is due to an organism which multiplies in the soil.

Unfortunately, thus far scientific proof of its existence is wanting, and the work that has been done on the subject has yielded no result, chiefly, in the author's opinion, because the investigators, impressed with the idea of the "*pregiudicio palustre*," have confined their attention to organisms found in marshes; he cites Salisbury, Lanzi and Terrigi, Balestra, Bayellini, Safford, and Bartlett, as examples.

The author and Klebs in 1879 were, he says, the first to examine a large number of malarial and non-malarial soils, with the result that an organism, a kind of bacillus, was discovered and minutely described. He goes on to say that these researches, and those of later observers, have put it almost beyond doubt that an organism of this kind is concerned in the production of malarial fevers. More recently he

says Marchiafava and Celli have demonstrated that this parasite directly attacks the red corpuscles of the blood, causing characteristic changes.

Many observations made lately in Rome tend to show that this parasite does not always assume the perfect bacillar form described by Klebs and the author. This, he says, does not concern the hygienist, for whom the essential point is that he has to deal with a living ferment which will thrive in soils of the most various composition, and without which neither marshes nor foul stagnant water are capable of producing malaria.

It is a mistake to suppose that all soils containing this ferment poison the superjacent atmosphere, for it is known that outbreaks of fever occur when soil, malarious in ancient times, is stirred up by cultivation or excavation. From this he argues that the ferment can remain in a latent state, or state of inertia, for centuries. The long time during which the seeds of plants may lie dormant is used by the author as an argument in favour of the possibility of this latency or suspended activity.

The conditions necessary for the development of the poison are thus stated :—

1. A temperature not less than 20° C.
2. A moderate amount of permanent moisture in the soil.
3. Ready access of oxygen to the strata which contain the ferment.

Natural causes tend to diminish or suspend the activity of the ferment.

In winter condition No. 1 is wanting, though a few very hot days have often been known to be followed by outbreaks of fever even in winter.

In summer condition No. 2 fails if the heat be sufficiently prolonged. This, he says, occurred in the Agro Romano in 1881-82, though a single heavy shower of rain causes the reappearance of the disease with even greater force.

Condition No. 3 is affected favourably for man when—

1. The malarious soil is covered by natural top dressing (*colinate*) formed by alluvial deposits, or
2. By the felting together of the roots of the grass on a strong pasture. Both these circumstances prevent the access of oxygen to the soil which contains the ferment.

The efforts of man must of necessity be confined to the destruction of two of the conditions, by (1) excluding the oxygen by means of top dressings (*colinate*), and (2) removing the subsoil water by drainage.

The paper then goes on to refer to the difficulties of draining land properly, and to the system of "tunnel drainage" practised by the Etruscans, Latins, Volscians, and Romans (*Practitioner*, Oct. 1881, vol. xxvii. p. 295). A double system of drainage may sometimes be practised, viz., by subsoil drains, and in addition assisting the surface evaporation, *e.g.* by cutting down woods, &c.; and the author says: "In very wet malarious districts the combination of subsoil drainage with drying (*disboscamento*) of the surface of the ground produces great benefit in almost every part of the world." He then goes on to discuss the value of the advice given by Lancisi in 1714, *not* to cut down a wood between the Pontine marshes and Cisterna. Lancisi was, he says, an ardent believer in the "*pregiudicio palustre*," and though he (the author) pointed out in 1879 that the health of Cisterna had greatly improved since the cutting down of this wood twenty years before, *i.e.* about 1850, he was even then attacked by upholders of the Lancisian theory. The result of the controversy was, however, to induce Miceli, the Minister of Agriculture, to appoint a commission to study the matter (*Annali di Agricoltura*, N. 77, 1884; Roma, Eredi Botta). The report of this commission goes directly against the theory of Lancisi.

As to attempts to effect the drainage of the soil by planting trees, and especially eucalypti, the author says he knows of no case in which such plantations have done any good, either by draining the soil or by exhalations which are destructive to micro-organisms. He quotes Liversidge to the effect that malaria is common in the midst of vast blue-gum forests, and concludes that eucalyptus plantations are utterly useless from an economical and scientific point of view; that it is often necessary to drain the soil in order that the young trees may grow, and that with every care large numbers die.

The use of top dressings (*colinate*) combined with subsoil drainage is more likely to be of service. As an example of the effectiveness of this method he cites the part of the

Janiculum near the Palazzo Salviati della Lungara. This year there have been no cases in the new military college in this palace, whilst in the Palazzo Corsini, on the same side of the Lungara, but overlooking land on the Janiculum still uncovered, there have been several cases, some fatal.

In Rome itself there is abundant proof of the utility of good atmospheric conditions. The most evident is the construction of new quarters of the city. The question was, should the new houses be built in the valley of the Tiber, or on the Quirinal and Esquiline, which were known to be malarious, and believed to be irredeemably so, *because the malaria was carried to Rome from the marshes on the coast*. The author and others opposed the idea, arguing that the Viminal should also be malarious, for it lies between the two, whereas such is not the case. The result has justified the opinion, for the new quarters of the town on these hills are as healthy as the ground on which they stand was formerly unhealthy—a change produced, according to the author, by the covering up of the malarious soil with buildings and impervious roads. The poison is still in the soil, for if it be greatly disturbed during the hot damp season, cases of fever still occur.

While our ideal is to effect a permanent destruction of the malaria the possibility of this seems far distant, for we are still very much in the dark as to the conditions necessary to be established for the complete destruction of the poison. All our efforts at present are purely suspensory in their results.

*Practically* we know a great deal, and it is possible that in many cases drainage and high cultivation may so modify the composition of the soil as to render it sterile as regards the malarial poison. All the work done by the ancients was purely suspensory in its result, for no sooner did the land begin to be deserted than it returned to its original unhealthy state. Under the Antonines it would appear that the Roman Campagna was healthy, but after the fall of the empire it reverted to its original malarious condition.

Unfortunately, high cultivation does not always yield a good result—too often, indeed almost always, the first effect is a great increase in the unhealthiness of the locality, due, probably, to the turning over of the soil, and the consequent more intimate

contact with the oxygen of the air. This has occurred again and again in Italy and in America. Sometimes the ultimate result is good, but frequently the aggravation produced is persistent, and it has been found necessary to convert the land into pasture, and so cover it with an impermeable layer of grass roots in order to diminish the malarious property.<sup>1</sup>

The question then is: granted that high cultivation is desirable, how can we determine whether it should be attempted upon a particular area of land—a question all but impossible to answer. The labourers must not remain on the soil during the warm season, and, such being the case, cultivation becomes almost impossible. We can only therefore strive “to increase the specific resistance of the human organism to the poison.”

How? Acclimatisation of the individual is impossible, and now all hope of acclimatisation of the race must be abandoned, though it might have been possible in the past. The process of natural selection is now interfered with by means of such remedies as we have. A large number of individuals constitutionally ruined by the disease are kept alive and allowed to propagate their species, with the result that a still more feeble race arises, with still less capacity for resisting the disease, and so matters go from bad to worse.

Our remedies are quinine, alkaline salicylates, and tincture of eucalyptus. The first is so costly as to be beyond the reach of the poor: the second produces great disturbance in the organism, and is of rather doubtful value; and the third can only be considered as useful in proportion to the alcohol it contains, and is perhaps after all not so valuable as good wine. That it is not a preservative against the disease the epidemics of 1880 and 1882 on the estate at Tre Fontane abundantly prove. The author states that having had occasion many times to observe the action of arsenious acid, he found that cases of relapse were rarer under this treatment than under quinine, and in consequence he advised the use of it among the *personnel* of the Roman and South Italian Railways. The experiment was

<sup>1</sup> It is possible that the plan of dressing the surface of the newly-disturbed soil with quicklime, used in Scotland to increase the fertility of the soil, might be useful in destroying malaria also, and its simplicity renders it worth a trial.—*Ed. Pract.*

begun in 1881, and continued on a larger scale in 1882 and 1883, and after the difficulties in the way of the administration of a supposed highly poisonous drug had been overcome, the results obtained were highly satisfactory. He says that Dr. Ricchi, the Chief Medical Officer of the South Italian Railway, took seventy-eight cases in the very malarious district of Bovino, and divided them into two halves. One half of these individuals only were treated with arsenic, *i.e.* thirty-nine: of these, thirty-six had no fever at all, and the remaining three very slight attacks cured by small doses of quinine without the intervention of the doctor; whilst in the other half a large number of cases occurred, some of them very grave.

The body-weight of those treated with arsenic was found to be always increased, and the anaemia, when it existed, as constantly diminished. The dose began with two milligrammes a day, and in some cases was increased to eight, to ten, or even twelve milligrammes, care being always taken to avoid the cumulative action of the drug.

Despite the possible improvement of the malarious soil by proper drainage, &c., and the undoubted value of arsenic as a prophylactic, we must not forget that the real curse of malarious districts is not to be measured by the number of acute or fatal cases, but by the awful degradation of the race which takes place in consequence of the enfeeblement of individuals. The slow but progressive anaemia is the real evil, and quinine appears to increase this anaemia when used continually to cut short acute attacks. Some other remedy must therefore be sought.

Dr. Maglieri has found the following, in use among the peasantry, very efficacious—

Cut a lemon, skin and all, into small slices, and boil it in three tumblers of water until the fluid is reduced to one-third; strain and squeeze the residue thoroughly, and allow it to cool, and drink the resulting decoction fasting. This popular remedy has been found to be of the greatest use in all stages of fever, even in acute cases.

Dr. Pietro Cervello of Palermo, Dr. O. Ferraresi of Rome, and Dr. G. Maseagni of Arezzo, have experimented largely with this remedy, and have all obtained excellent results. The author thinks popular experience is of great value. We should

free ourselves from the idea of "*pregiudicio pulustre*" and apply ourselves to the extinction of the poison *under our feet*. The author also refers to the protection afforded by sleeping several feet above ground, as practised in most malarious countries.

The solution of the problem must be such an one as shall be within the reach of all agriculturists. Purely scientific methods for combating the disease have not yet been found. The author concludes by urging the importance of long-continued and methodical experiment.

## Reviews.

*The Inhalation Treatment of Diseases of the Organs of Respiration, including Consumption.* By ARTHUR HILL HASSALL, M.D. Crown 8vo, pp. 367. London : Longmans, Green and Co. 1885.

DR. HILL HASSALL treats of a most important matter in this work. Although several good books have been published on the subject abroad, especially in America by J. Solis Cohen and in Germany by Oertel, Dr. Hill Hassall's is the first comprehensive work published in England. The author endeavours to show that the majority of ingenious contrivances recommended as oral or oro-nasal inhalers fulfil their purpose most imperfectly, as only small portions of the substances used for inhalation leave the inhaler, and scarcely any passes through the larynx. He wants the inhalation-treatment to be carried on systematically, and so thoroughly that the entire constitution is brought under its influence ; that, for instance, when antiseptic remedies, such as creasote and carbolic acid, are used, the urine should give evidence of their presence.

The seven chapters of the work are : (1) the entrance of medicaments into the organs of respiration ; (2) the principles concerned in the volatilisation and inhalation of medicaments ; (3) the apparatus ; (4) inhalation chambers ; (5) the quantities of medicaments used ; the manner, frequency and duration of the inhalations ; (6) the medicaments employed in inhalation ; (7) the inhalation treatment of diseases of the organs of respiration. The author has already published some of his researches "On the Comparative Inutility of Antiseptic Inhalations as at present practised in Phthisis and other Diseases of the Lungs" in the *Lancet* of May 1883, and again in the *British Medical Journal* of November 1883. In the fourth chapter he describes inhalation-chambers—as it seems to us the most certain means of introducing the substances desired to be inhaled—which, however, can only rarely be employed in the private houses of patients, although in hospitals and sanatoria for the treatment of diseases of the respiratory organs there would be no difficulty. In the sixth chapter are discussed the various methods of

using the so-called pneumatic chamber which are practised at several health-resorts on the Continent, for instance at Ems (Dr Lange), at Reichenhall (Dr. von Liebig) at Meran (Dr. Knauthe), and also at Lyons, Montpellier, Nice, and other places. The method of inhalation of compressed air and exhalation into rarefied air is specially useful in some forms of chronic disease, such as emphysema. We have repeatedly witnessed rapid relief of dyspnoea for the time being, and for some time after the removal of the patient from the apparatus; and we have also seen very satisfactory effects from the continued use of compressed air in chronic bronchitis, and dilatation of the heart—especially of the right ventricle. Dr. Burdon Sanderson, in 1868, gave in the *Practitioner* a description of the apparatus at Reichenhall. Dr. Hassall describes the different remedies used for inhalation, their doses, modes of administration, and special indications; and in the seventh chapter he enters fully into the manner of treating the different diseases of the respiratory organs by inhalation.

The book is full of instruction, and most practitioners will feel themselves amply rewarded if they peruse and occasionally consult it.

*Diseases of the Heart and Thoracic Aorta.* By BYROM BRAMWELL, M.D., F.R.C.S.E., etc. 8vo, pp. 783. Edinburgh : Young J. Pentland.

THE author writes, as he has clearly worked, keeping well in view the theoretical as well as the clinical aspect of his subject. His book has certain defects incidental to the lecture form in which it was originally prepared, and some of the repetitions, which are necessary in lectures, might well have been avoided in the systematic work. Nevertheless, the book is well written, readable, and easily understood. Great use is made of distinctive typography, and the diagrams and illustrations are well chosen and carefully executed.

In the anatomical and physiological introduction to which the early chapters are devoted, the special bias of the author at once reveals itself by the space devoted to the neurological section, and it is to some neuro-pathological explanation that the author seems throughout almost unconsciously to incline in all cases of difficulty.

The importance of the due nutrition of the tissue of the heart is properly emphasised in the later pages, and it is the more surprising that this subject is not more fully treated in the introductory chapters. Considering its importance, a whole section might very well have been devoted to the coronary circulation, but this is only superficially dealt with. Many of the so-called functional disorders of anæmia and allied

conditions are really nutritional, though on the other hand general anaemia and malnutrition are not uncommonly the result of cardiac failure. To the cachexia which often develops in the course of cardiac disease, and as the result of it, no reference is made in the general symptomatology.

After the introduction, sections are devoted to the general pathology of the heart and to the methods of clinical examination. The definition of cardiac murmurs is an acknowledged crux, and the difficulty is not overcome in the present book. Cardiac murmurs are defined as "new sounds heard either in place of or along with the heart-sounds." And they are distinguished as absolute or quantitative, and simple qualitative modifications of the heart-sounds. These terms make confusion worse confounded and are not justified by clinical observation, but the author rightly lays great stress upon the sharp distinction which must always be made between heart-sounds and murmurs, which is after all the practical point, and this distinction is well represented in most of the diagrams of murmurs given. The difficulty is due to the fact that we have no means of measuring, except by the ear, the length of the healthy heart-sounds, and when the first sound is stated to last approximately  $\frac{4}{5}$  of a cardiac revolution, the possibly fallacious nature of this statement must be borne in mind.

To one further statement exception must be taken, viz.:—the diminution of the first sound, "which is certainly present" in cases of mitral stenosis. There must be some confusion in the use of the words here, for if the first sound at the apex is meant, the author stands in opposition to most other observers.

A good summary is given of the causes and theories of functional murmurs. The balance of authorities inclines towards the theory of muscular incompetence, and especially since Dr. MacAlister published his inferences from Ludwig's and Hesse's work, but it is difficult to accept this theory as sufficient in all cases.

In speaking of congenital displacement of the heart, a case is quoted to show that the heart may be on the right side while the liver is in its normal place; as there was not post-mortem examination the evidence is not conclusive. It may well have been an instance of acquired dislocation and not of congenital malposition. Displacement downward also, might, it is true, theoretically be the result of collapse of the abdominal viscera, as the author states, but the tendency is compensated by the falling in of the abdominal walls and not by descent of the diaphragm.

In considering cardiac dilatation, the epigastric pulsation in dilatation of the right side is regarded erroneously as indicating displacement of the apex downwards and towards the right, the

true apex, however, is in these cases either in its normal position or if displaced lies further outwards towards the left. In one or two other places the distinction is not sufficiently sharply drawn between the apex beat and abnormal pulsation over the cardiac region.

The predominant influence of the author's neuro-pathological bias is well seen in the discussion of angina, where no mention whatever is made of dilatation, though in other hollow muscular organs like the bladder or intestines, distension is a very common cause of severe pain which is, moreover, often paroxysmal. Again exception must be taken to the statement that Cheyne-Stokes breathing is closely allied to angina *sine dolore*, as well as to the assertion that in Cheyne-Stokes breathing patients are conscious of their dyspnoea.

The chapters upon the special diseases of the heart though well put together and practical contain nothing novel; the most characteristic and important part of the book is undoubtedly the introductory part to which 300 pages out of the whole 775 are devoted. The last two chapters are occupied with cardiac neuroses and diseases of the thoracic aorta. The last is not of equal merit with the rest of the book. It was clearly delivered at the end of a course of lectures and should have been either omitted or greatly expanded.

The pulse is very fully described, and its diagrammatic representation, but the author rightly states that no instrument can take the place of the intelligent finger. The pulsus paradoxus has however many other causes besides mediastinitis. In an appendix to the volume the cardiograph and its application to diagnosis is fully discussed, and this account will be found useful by those interested in the subject, as would also the summary of our knowledge upon ulcerative endocarditis, had the subject not been so much more fully treated of late in the published lectures of Professor Osler.

It will thus be seen that Dr. Byrom Bramwell's work, though in some respects open to friendly criticism, is a useful addition to the literature of the subject and is well worthy of perusal, especially by those who wish to learn the bearing of recent physiological work upon the clinical study of disease.

## Clinic of the Month.

**Pent-up Secretions.**—Mr. Wheelhouse illustrates a most interesting lecture on the subject of "pent-up secretions" by typical cases showing the way in which most distressing symptoms may sometimes be relieved, if it be discovered that some secretion is pent up, and this secretion be evacuated. The case of a young gentleman is narrated, to whom the author was called, and found on the point of suffocation. On physical examination it was discovered that the left pleura was full of fluid. A Roberts's trocar was thrust into the side, and six pints of clear fluid were withdrawn, giving instant relief. Another time, Dr. Clifford Allbutt called the author to a case of acute rheumatic fever. The patient was dying from acute pericardial effusion; a small trocar and cannula was thrust along the upper margin of the fourth left rib, the serum was drawn off, and the patient soon recovered. A third case is given in outline, where a young lady of wealth, living in a mansion surrounded by everything conducive to health, yet constantly suffered from what was supposed to be well-marked blood-poisoning. At length the patient's regular medical attendant decided to enquire fully into the question of the "periods," and, on examining a diaper, found that there was only a small amount of "fœtid" discharge upon it. A second opinion was obtained, and an examination, under ether, was insisted upon. It was then found that the patient had a hymen so nearly perfect, that only a tiny aperture existed to permit the exit of the natural excretion. On freely dividing the membrane, the vagina was found converted into a distended sac, its walls being granular and over-vascular, thus presenting a very large absorbing surface. A few months sufficed to make a complete and perfect cure of all her troubles. The most remarkable advance made in the treatment of cases of phthisis is the method of opening phthisical cavities through the back, and draining them by means of drainage-tubes, thus relieving the cough and fœtid expectoration. (*Brit. Med. Journ.* Jan. 1885.)

**Corrosive Sublimate and Glycerine in Epithelioma of the Cervix.**—Dr. Biddle, Kingston-on-Thames, writes:

There are few things in the way of palliative treatment that have given me greater satisfaction than the use, in a case of epithelioma of the cervix uteri, of a lotion or injection containing one-fourth of a grain of corrosive sublimate, and half an ounce of glycerine, to a pint of water. Before using it, a patient of mine had, for seven or eight months, been subject to paroxysms of agonising pain, and to frequent haemorrhages, which were occasionally profuse. Immediately upon its employment, and for the last three months of her life, the haemorrhage became merely nominal; and, instead of agonising pain, there was simply the distress consequent upon irritation (by the tumour) of the bowel and bladder, the latter of which became perforated a week before death. I attribute the beneficial change to the very marked reduction in the amount of infiltration. The lotion was used continuously, with very few exceptions, twice a day during the three months, and I shall certainly adopt the same treatment in the next case I have, even before recovery is despaired of. In the case referred to, it was not tried until the curative effects of chromic acid had been tried in vain. (*Brit. Med. Journ.* March 28, 1885.)

**Salicylates in Enteric Fever.**—Dr. Leon Beco of Liège has published some instructive observations on the use of salicylate of sodium as employed by Dr. Collard of that city in the treatment of typhoid fever. In his paper he draws a comparison between the action of this drug and of quinine in such cases. By the method referred to ȝj to ȝiss of the salicylate is given in two doses between the hours of noon and 2 P.M. The effect is that the evening rise of temperature is checked or prevented, a rise occurs the next morning in cases of high fever, while in others of moderate severity the evening reduction continues, and the morning temperature is maintained about the normal level. Sometimes the remission lasts for thirty-six hours without further medicinal interference. At the end of that period, or before, the febrile reaction usually mounts to its original point to be again reduced as at first. After a few days the tendency to rise is decidedly lessened. The obvious result of the salicylate therefore is, that the fever is arrested in its ascendant stage, while its morning fall is not unduly accentuated, and the strength of the patient is husbanded in proportion during both day and night. Quinine, on the other hand, at least as given in Liège, has an opposite tendency. The routine practice is to administer fifteen to thirty grains in one or two doses towards 6 o'clock P.M. in order to deepen the morning depression of temperature. The result is *nil* as regards the vesperal exacerbation of fever, and the fall observed next morning is commonly from 1°8 to 2°7 F. The course of the

disease is consequently not much modified, and such change as there is tends to weaken while it cools the patient. On these grounds, and also because of the greater tolerance on the part of the stomach and system generally in regard to sodium salicylate than quinine, Dr. Beco greatly prefers the former remedy. In his series of investigations the patients under treatment numbered sixty-four. The salicylate was given as above 500 times. Its antipyretic action was constant, it was usually retained by the stomach, while other advantages were its solubility, stability, and fairly palatable flavour, which might be improved by the addition of various syrups. Sometimes it was vomited; in such cases a dose of forty-six grains was given an hour later, and the drug was usually well borne next day. If not, the full quantity given by enema with a little laudanum was retained and did not, like quinine enema, irritate the gut by any acid solvent contained in it. Among other secondary benefits conferred by the salicylate were the reduction of the pulse, with general sense of relief, a lessening of the emaciation or weakness common in enteric fever, and comparatively rapid convalescence. Both Dr. Beco and Dr. Des Plats have observed an apparent diminution of the duration of typhoid cases under this treatment. The dread of haemorrhage associated with it by Vulpian they consider to be unreal, as no excess of this complication has appeared among their patients, nor has its course when it was present varied with the use or disuse of the drug in question. Dyspnea and delirium have been equally absent, the latter disappearing with the reduction of fever. As shown by the occurrence of sweats, a certain depression of the general circulation has not been wanting; this symptom requires watching but as a rule its effect is compensated by the diminished loss by febrile metabolism. Four deaths occurred in the sixty-four cases; in three instances the fatal issue was preceded by well-marked delirium and other symptoms indicating meningeal complication; in the fourth the patient was in a state of prostration when admitted; even these, however, showed the control of salicylate of sodium over the temperature. The charts and notes of cases appended to this paper show also very clearly the exactness and rapidity with which the fall and rise of fever tally with the use or disuse of this remedy. Most of the patients treated were young people, the age usually varying from seventeen to thirty years. Asthenic cases appeared to benefit as well as the more sthenic. Stimulants were employed according to rule, when required to counteract depression. In one instance a high temperature was long maintained in spite of the salicylate, but here the evident cause of trouble was the presence of sloughing sores on the feet. In the great majority of cases it was interesting to note how even hyperpyrexial

temperatures were lowered and kept down at the normal standard by this treatment without material effect upon the general strength of the patient. (*Progrés Médical*, January 3, 10, 17, 1885.)

**Hemiatrophy of the Face.**—There are not a large number of cases of hemiatrophy of the face, most of them being collected by Eulenburg in *Zieussens Cyclopaedia* vol. xii., and to these Dr. Giovanni Mingazzini has added one from his own observation in Rome. P. V., a Roman girl, had had intermittent fever from a child. When aged fifteen she had sudden left hemiplegia which got slowly better in nine months; soon after this she came back to the hospital with cardiac disease, which she had only noticed, she said, after the hemiplegia. Nearly two years later she began to notice some abnormality of the face as well, and came back to the hospital with increased cardiac discomfort from aortic disease, and with some hemiatrophy of the right side of the face. She was then eighteen, somewhat excitable, somewhat hyperesthetic, both knee reflexes were in excess. The right cheek was only slightly atrophied but flushed on excitement more easily than the left; the lips and nose were twisted towards the right, the right half of the tongue and of the uvula was atrophied; the right eye sunken and rather small and more watery, and on the right side the molar and canine teeth had fallen out. Surface temperatures were carefully taken and showed the atrophied side the warmer in all cases: on the cheeks the difference was as much as  $1^{\circ}5$  F., in the axillæ  $0^{\circ}7$ , on the sides of the head  $0^{\circ}4$ . There was neuralgic pain over the right side of the head, indefinitely localised: no pain was caused by pressure on the cervical ganglia. Surface temperatures have been observed in two previous cases; in one Friedenthal found the affected side warmer than the unaffected; in the other Brunner found it less warm. There are no post-mortem records of such cases as this to guide in determining the pathology and therefore it has to be founded upon the symptoms in life. In this case Dr. Mingazzini can go no further than to say that an injury of the cervical sympathetic affecting the trophic fibres which run to join the fifth nerve would probably suffice to explain the symptoms; and he would trace the hemiatrophy of the tongue and uvula to the lingual, and the neuralgia and falling out of the teeth to the infra-orbital and inferior maxillary nerves. (*Lo Sperimentale*, Feb. 1885.)

**Treatment of Incarcerated Hernia by Ether-Irrigation.**—In the *Russkiaia Medits.*, No. 3, 1885, p. 62, Dr. D. V. Bartosz, of Rominy, Poltava Government, writes that during the last two years he used ether-irrigation with brilliant

success in all his cases of strangulated hernia, seventeen in number. Irrigation was performed after Finkelnstein's method ; that is, a tablespoonful of ether was poured over the tumour every half hour. The hernia disappeared spontaneously, or under slight pressure in the worst cases, within four or five hours. The duration of strangulation varied between a few hours and four days. The author describes, also, a case of internal intestinal obstruction in a woman, aged sixty, with nine days' constipation, incessant faecal vomiting, tympanites, thready pulse, &c. ; in which, after all the usual means had failed, ether-irrigation all over the abdomen brought about profuse stools in an hour and a half, the patient completely recovering. [Practitioner, xxix. 365.] (*London Medical Record*, April 15, 1885.)

**Tabes Dorsalis in Women.**—Möbius has described thirteen cases of tabes in women, making, with cases previously published, altogether eighteen, in which special attention was directed to any syphilitic taint which might be present. It will be remembered that the opponents of the theory of the syphilitic origin of locomotor ataxy lay stress on the circumstance that, when tabes occurs in women, no specific history or symptoms are found, and that the disease is therefore owing to entirely different causes, such as the influence of cold, damp, &c. Möbius, however, has by careful examination succeeded in eliciting a syphilitic history in all but two of his female cases. This must be, in the nature of things, a point of great difficulty and one which it is only too easy to overlook in examining a case, unless specially enquired into. If we consider, in addition to this, how eager women generally are to deny that they ever had such a disease, it will be acknowledged that some positive evidence is of more importance than numerous negative statements. Moreover, the immediate consequences of infection are often in women so exceedingly obscure, that they are themselves unaware of being infected ; and mild forms of primary and secondary syphilis are known to lead more commonly to tabes in after-life than severe manifestations. Möbius has found that the age of these women was between twenty-one and forty-three, the same as in men, where the disease habitually occurs in the prime of life. All had had sexual intercourse ; tabes has never been observed in a virgin, nor in women whose character or habits of life rendered infection unlikely. None of the patients had had severe secondary or tertiary symptoms, but a good many had had suspicious discharges, buboes, miscarriages, baldness, ulcerated throat, and cutaneous affections. It is known that women who have had connexion with syphilitic men, and given birth to syphilitic

children, may never have shown signs of syphilis themselves, and yet have undergone a change in their constitution in so far as they have acquired an immunity against primary infection. Some authors call this syphilisation, and look upon it as a sort of inoculation. Such syphilisation may possibly be sufficient for the causation of tabes. None of the women examined by Möbius had any symptoms of syphilis at the time, except slight enlargement of lymphatic glands and old cicatrices, showing that the affection had been mild. The interval between infection and the beginning of tabes was on the average seven years; the shortest being four, and the longest fifteen years. Several of these patients had given birth to healthy children, either in the interval, or after the outbreak of tabes. As far as exciting causes were concerned, the puerperal state appeared to have been frequently instrumental in accelerating the evolution of tabes; the debility caused by profuse haemorrhage aggravated the condition in one case. The influence of cold was also mentioned in several cases: depressing emotions and the neurotic constitution appeared to be less effective. In a number of cases, however, no exciting causes whatever could be determined. (*Centralbl. für Nervenheilkunde*, Oct. 15, 1884: *London Medical Record*.)

**Over-schooling and Chorea.**—Dr. Sturges has given the results of an analysis of 200 cases of his own. In seventy-nine of known etiology fourteen were due to schooling. Chorea is not by preference a disease of the poor. It is more frequent among them because their children are less closely observed, and more often the beginning manifestations are overlooked or ignored. They are more susceptible from improper food and other depressing physical causes. In school the main factors are the excitement of competition, the effect and fear of punishment, the despair and worry over lessons too long or too many, and others of a similar character. When these have lasted long, an exciting cause, as a fright, may begin the disease at any time, although very trivial in itself. The one branch of study which appears most often to produce mischief is mathematics. "Sums," again and again, were found to be the great bugbear and source of trouble. A little knowledge on the part of teachers and parents of the first manifestations of chorea is greatly to be desired. So, when a careful child grows careless, when the handwriting suddenly deteriorates, when the position in class is repeatedly lost, when slates and books are constantly dropped, when there is obvious facial movement in reading and writing, suspicion should always be aroused, especially in girls, and all schoolwork suspended for a time at least. In this way many attacks can be warded off. (*Lancet*, Jan. 3, 1885.)

**Viburnum Prunifolium as a Uterine Sedative.**—Attention was first called to this drug in 1866, by Dr. Phares of Newtonia, Miss., who regarded it as a “nervous antispasmodic, tonic, astringent, and diuretic,” and as “particularly valuable in preventing abortion or miscarriage, whether habitual or otherwise.” Further trial has been made by Dr. J. H. Wilson, Liverpool, of its influence in cases of threatened abortion, and several are detailed in which its administration was uniformly successful. In the cases cited, abortion threatened at periods varying from the earlier weeks of pregnancy to the seventh month, and Dr. Wilson found it act as a “sedative and tonic to the uterine nervous system.” He believes that, if given early, and before the ovum is thrown off, most cases of abortion may be prevented.

The drug may be given as a liquid extract in  $\frac{3}{4}$  doses, but in this form is apt to induce nausea. An extract in doses of two to four grains in pill is more palatable. Only in one case was “throbbing of the temples” complained of as due to its administration.

Dr. Wilson admits that several of his cases might have done well under ordinary treatment, but is disposed to believe that “convalescence would not have been so speedy or satisfactory.” (*Liverpool Med. chir. Journal: Glasgow Med. Jour.* Jan. 1885.)

**Nitrite of Amyl an Eliminator of Uric Acid.**—Dr. Macdonald, of Liverpool, writes:—On September 13th, 1882, I attended a case of what is usually called puerperal eclampsia. After the first hour, and during three and a-half hours, I repeatedly gave nitrite of amyl by inhalation, in the usual way and dose. In the course of the following eighteen hours one minim of nitro-glycerine, of 1 per cent. solution, was four times administered, and chloroform to a limited extent, as well as an operative procedure, also marked that period. Nine hours after the last dose of nitro-glycerine—that is, about  $31\frac{1}{2}$  hours after the first inhalation of nitrite of amyl—I drew off the urine. After standing for nearly 48 hours, it was seen to have deposited, *inter alia*, crystals of uric acid. Then this fact somewhat puzzled me, but I was inclined, for reasons which need not be specified, deduced from the hypotheses of authorities on the subject of this eclampsia, to look upon this as an interesting clue to a rationale of the colchicum treatment of the disease. A notice of the observations of Signori Giuseppe and Sansoni, of Turin, however, has forced me to reconsider the point. Accordingly, I instituted a check-experiment, the subject of which was a healthy adult, whose urine was previously normal. The experiment, except in the non-administration of chloroform, corresponded, as far as possible, with the case just mentioned. Thus, from 10.45 A.M. till 2.50

P.M. seven inhalations of 5 minims each of nitrite of amyl were taken. The urine passed at 4 o'clock, an hour after food, was of a clear dark straw-colour, very acid in reaction, and, on cooling, deposited a little mucus, and copious urates. One ounce without the urates, but *plus* a drachm of hydrochloric acid, showed after forty-eight hours had elapsed, a large deposit of uric acid crystals. Also, as in the former case, nitro-glycerine was taken. A similar quantity, passed seven hours after the last, almost free from visible urates, similarly treated, gave what may be relatively termed a very considerable deposit; and next day (36 hours after the first drug was first administered), from the sample, a considerable amount of the crystals was obtained. I hope shortly to narrate an experiment with regard to the effect of nitro-glycerine *per se*. Thus I was able to confirm the statement of the Italian observers named, and also to find that the balance of fact against theory compels me now to believe that the excretion of uric acid in the case of eclampsia was, at all events, largely due to the drug employed, and not wholly to the disease, and that no deduction could be drawn from the premisses as to any connexion between the gouty diathesis and puerperal eclampsia, or the consequent colchicum-treatment of that affection. My enquiry into the symptom had no pretence to be exhaustive; the case, however, is pretty clearly, though not yet quite logically, proven now. A practical application of this property of the nitrite of amyl as an eliminator of the gout-poison immediately occurred to me, to which I at once gave effect. H. G., of Tue Brook, a powerful slightly ruddy man, aged 37, had suffered from gout, and now had an attack, chiefly in the ankle-joint. For four days he had had an alkaline mixture with colchicum, and had obtained some relief, also, from local treatment. At 4 P.M. on April 17th his urine was clear straw-coloured; on standing it contained a very little mucus, no other deposit. One ounce acidulated with a drachm of hydrochloric acid as before, and set aside for forty-eight hours, showed only a very few crystals of uric acid. That statement enables a fair judgment to be formed of the state of matters previously to the use of the nitrite, during which the medicine and special local treatment were, of course, abandoned. The first inhaled dose of four minims was given by myself at 4.2; a faint flush and sensation of fulness in the head resulted. At 6, 8, and 10 o'clock the dose was repeated. Next morning, at 9, he was much better, but had a slight headache, which soon passed off. His urine passed at that hour showed a very acid reaction, and, being treated as above, gave what I describe, in the absence of a quantitative analysis, as a considerable deposit of uric acid. On the 20th he was able to walk, the ankle-joint being very nearly well. Remarks would be redundant. Further research is

manifestly required. I will only say that all I claim is to have established a *prima facie* case for the administration of nitrite of amył as a rational therapeutic agent in those cases of gout in which the usual contra-indications do not prevent its use. And if we can by its means procure a more than normal discharge of uric acid when an attack threatens, we may find it prophylactic as well as curative. (*British Med. Journal*, May 23, 1885.)

**Obliteration of one Lung and Displacement of the Heart.**—At the closing meeting of the Islington Medical Society, on the 26th ult., Dr. Glover gave the particulars and showed the specimens of two very striking lesions in the case of a man aged sixty-three, whom he had known for several years as a dispensary patient and otherwise. The most noticeable peculiarity was the complete displacement of the heart. It occupied the right side, and beat between the fourth and fifth ribs. This fact had been observed thirty-five years ago by Mr. Jackson, one of the oldest members of the Society, and the patient had been examined by many physicians, amongst others by Dr. Austin Flint, who came to the conclusion that there was no transposition of organs—a conclusion verified by the post-mortem. But the autopsy revealed another lesion, which was as remarkable as the malposition of the heart. This was the almost complete absence of the right lung. It had to be long sought for ere it could be found, and was then discovered as a very hard shrivelled substance, in shape something like a sausage. On being cut into, it was found to consist almost entirely of thickened pleura, the pleura being at points half an inch thick. The lung substance was nearly destroyed, not with intersecting bands of fibrous tissue, but by this envelope of thick pleura. The left lung was correspondingly large. No history of pleurisy could be traced in the patient's life, and no history of consumption in that of his family. He had always been weak and slight. His mother always had noticed “a beating on the wrong side.” He used to have severe bleedings at the nose. His chief troubles had been cough and rheumatism. He died in the Islington workhouse of broncho-pneumonia. It is common to say that a person has lost a lung, but here the statement was a literal expression of the fact, though the patient contrived to live without it, and with his heart on the wrong side, for sixty-three years. (*Lancet*, June 6, 1885.)

**Laryngeal Typhoid.**—Dr. Paul Koch, after an exhaustive study of the larynx in typhoid, arrives at the following conclusions:—(1.) True laryngo-typhoid has an actual existence; it coincides always with the acute period of the general disease. (2.) If symptoms of laryngeal stenosis are manifested during the period of convalescence from typhoid fever, they are an expression

of perichondritis, which is generally manifested in acute attacks of the disease of long duration. (3.) Operation is indicated as soon as the symptoms of laryngeal stenosis become persistent. (4.) It is always necessary in performing deep tracheotomy to avoid the cricoid region. (5.) It is necessary to abandon the perichondrial and peri-laryngeal inflammations to their natural course, which is very long, and not to attempt to hasten their cure. (6.) If after recovery the patient is unable to pass a cannula, two methods of treatment by mechanical resources remain, and, as a last resort, resection of the larynx may be performed. (*Revue Mensuelle de Laryngologie, d'Otologie, et de Rhinologie*, Feb. 1885.)

**Nervous Colic.**—Dr. Shershevski reports a number of cases of colic which seemed to be due to a neurasthenia of the nervous elements of the intestinal canal. They were all in intelligent individuals whose work was chiefly with the head. These persons suffer habitually from constipation, with abdominal distension and burning eructations, but without loss of appetite. From time to time, under the influence of prolonged intellectual work or of mental emotions, an aggravation of this condition occurs, with the following symptoms: Excessive meteorism with or without a discharge of gas from the bowel, superficial panting respiration, cyanosis, pains in the neighbourhood of the liver or in the umbilical region, or shifting, or feeling of weight in the lower part of the abdomen and severe tenesmus. The attacks subside after some days with the occurrence of copious evacuations. Shortly before their onset the faeces become flattened, as if there were an intestinal stricture. The author attributes these symptoms to a lesion of the nervous system producing an intestinal spasm located in the circular fibres of the muscular coat. This theory of the etiology would seem to Dr. Shershevski to be demonstrated by the action of the remedies employed. For, while purgatives increase the pain and constipation, opium and belladonna reduce the meteorism and cure the attacks.—(*Lyon Médical*, March 1, 1885.)

## Extracts from British and Foreign Journals.

**The Forced Feeding of Phthisical Patients.**—Dr. Störk, of Vienna describes a method for the enforced feeding of phthisical patients, which he has introduced lately, in place of the meat-powder given by the stomach-pump, to which some patients greatly object. He prepares a mixture of finely-triturated ham, mixed with milk, and introduces it, by means of a syringe, through a catheter, which is passed down only as far as about the level of the larynx. This is much better borne by the patients than the other method; and, when pain was present, interfering with the introduction of the catheter, he found that it was entirely prevented by brushing the fauces with a twenty per cent. solution of hydrochlorate of cocaine. (*Wiener med. Blätter*, December 25, 1884.)

**The Treatment of Herpes of the Cornea.**—M. Galezowski considers febrile herpes of the cornea to be a disease of frequent occurrence in cold and moist seasons. It is characterised by intense photophobia, lacrimation and perikeratitic redness. The margin of the cornea presents fine ulcerations as though portions of the membrane had been eroded with the point of a pin. As a rule they do not penetrate deeper than the layer of Bowman, and they are arranged in a radial manner from the centre towards the circumference along one or more radii. A remarkable feature of the disease is that the cornea is perfectly insensitive. Throughout the whole extent of the herpetic eruption the cornea may be rubbed or pressed with a probe or needle without the least pain being experienced. The other parts of the cornea, however, preserve their normal sensibility. The total anaesthesia of the cornea in the affected portion distinguishes the disease from phlyctenulae of the cornea, and from abscess of this membrane. The treatment of the disease consists in the employment of the compressive bandage, especially combined with moist heat in the form of spray and boric acid. This acid, he believes, destroys the microbes which accumulate in corneal ulcers and facilitates the process of cicatrisation by acting as an astringent. He prescribes it in

three forms. (1) In a 2 per cent. solution, either as a lotion, or a douche, or a spray. (2) In the form of an ointment containing one grain of the acid to forty of vaseline introduced between the lids two or three times daily. (3) In the form of a fine powder which should be applied to the surface of the cornea with a camel-hair brush. He exchanges the boric acid for atropine or pilocarpine once or twice a day. Internally quinine may be administered with advantage. (*Recueil d'Ophthalmologie*, March 1885.)

**Corrosive Sublimate as an Antiseptic in Ophthalmic Surgery.**—M. Chibret read a paper before the third session of the French Society of Ophthalmology in which he pointed out that notwithstanding the benefits that may frequently be obtained from the use of boric acid and carbolic acid when an antiseptic is required they frequently disappoint expectation. M. Chibret has for the last eight months employed corrosive sublimate with great advantage. At first he used it in the form of lotions and ointments but lately he has had recourse to irrigation, the strength of the solution being 1 in 2000, a strength that is well borne by the healthy eye. It may be applied six times daily. In the first instance, M. Chibret employed it in cases of keratitis with severe and extensive inflammation and hypopyon. Struck with the extraordinary diminution in the degree of suppuration he ventured to employ it in a case of panophthalmia from punctured wounds and was not afraid to allow the fluid to penetrate into the interior of the eye. He was delighted to find the ophthalmia promptly arrested. In other cases of keratitis the same success attended the use of the remedy. He dwells on the importance of making the jet of fluid impinge with a certain amount of force on the tissue of the cornea and sclerotic, so as to have a certain penetrating power, and so to act not only on the surface but upon the deeper layers of these membranes. When the eyes are very irritable and the jet cannot be well borne, cocaine may be employed. (*Recueil d'Ophthalmologie*, March 1885.)

**Local Anæsthesia in Ophthalmic Diseases.**—M. S. Baudry, Professor at Lille, has written a pamphlet in which he considers fully the advantages and disadvantages of chloroform, ether, nitrous oxide gas, bromide of ethyl, bichloride of methylene and hydrate of chloral, as well as of mixed anæsthesia in ophthalmic diseases and operations, and in a concluding section discusses the uses of cocaine. These he holds to be great since it suppresses pain, and both voluntary and reflex muscular action and ensures the absolute immobility of the eye. It is especially available in most of the operations practised on the superficial parts of the eye such as those for extraction of foreign bodies,

pterygium, paracentesis of the anterior chamber, discussion, tattooing, direct application of the cautery. Also in cases of simple and senile cataract without iridectomy. Also it is serviceable in anaesthetising the mucous membrane lining the lacrimal canals. In docile patients it may be even used for the operation of strabismus. Inflamed tissues are not readily rendered anaesthetic by cocaine. It does produce complete relaxation of the muscles of the eye, and consequently it does not completely relax the tension of the globe. It is of little service to use cocaine with chloroform, since the chloroform narcosis must be carried to its full effect. It should be used in 4 or 5 per cent. solution; its effect is cumulative, one drop repeated at intervals of a few minutes rendering the cornea progressively more and more insensitive. (Pamphlet: *De l'Anaesthésie en Chirurgie Oculaire*, 1885.)

**Nitro-glycerine in the Treatment of Insanity.** Dr. J. B. Andrews of the Buffalo State Asylum, in a Report on New Remedies, states that nitro-glycerine does no good in the treatment of dementia beyond temporarily relieving the congestion of the extremities. In many cases of epilepsy it has a positively injurious effect. After repeated physiological and clinical experiments he also reports unfavourably regarding the use of paraldehyde and Jamaica dogwood as narcotics. (*Journal of Insanity*, October 1884.)

**Utero-ovarian Diseases and Insanity.**—Dr. M. A. Cleaves of the Harrisburg Lunatic Hospital finds that a large proportion of women in insane hospitals have some form or another of utero-ovarian disease, and that marked local and physical improvement accompanies improvement of local maladies. In the majority of cases, however, this improvement only reaches a certain point. Special treatment, however, rarely produces bad results, and the good generally done, though not so great as might have been expected, fully justifies the course of dealing with such diseases when they are associated with insanity. (*American Journal of Neurology and Psychiatry*, November 1884.)

**Treatment of Foetid Sweating of the Feet.**—Dr. J. S. Stewart recommends as the most satisfactory treatment, to have the feet thoroughly washed in hot water, then steeped for a few minutes in a solution of permanganate of potassium of the strength of from four to six grains in the ounce of water. The feet are then dried, not to be again wetted until complete exfoliation of the tanned cuticle has taken place. Hebra's lead plaster ointment is then thickly spread on strips of cloth about one inch and a-half broad, and the foot covered from the toes back over

the heel as high as the malleoli with these, arranged and applied like a scultetus bandage. Each toe should first be wrapped round with a strip of clean rag half an inch broad and thickly spread with the ointment. This dressing should be renewed every twelve hours with fresh rag and ointment, for a period varying from ten to sixteen days, according to the severity of the case and the thickness of the heel skin. In most cases the odour will be very much diminished by the end of the third day, and will not be perceptible by the ninth. The shedding of the skin takes place *pari passu* with the growth of the new cuticle, and may not be completed until the end of the third or even of the fourth week. (*Edinburgh Medical Journal*, March 1885.)

**Helenin.**—This is a new antiseptic which has been brought forward within the past few months. It is a concrete volatile oil, crystallising in quadrilateral prisms, and derived from *Inula helcium* or elecampane. It was discovered as long ago as 1660 by Lefebre, pharmacist to the king of France, but its medicinal properties were described only recently by Korab [*Practitioner*, xxx. 62]. It diminishes all the secretions, especially of the trachea and larynx, and will in small quantity prevent the sialagogue and diuretic action of jaborandi. It is a powerful antiseptic, one centigramme (about  $\frac{1}{7}$  grain) being sufficient to prevent putrefaction in a litre ( $1\frac{3}{4}$  pint) of urine. On account of its antiseptic properties and of its affinity for the respiratory mucous membrane, it has been proposed as a remedy for pulmonary tuberculosis. Dr. Baeza has been studying this drug (*La Crónica Médica*, February 5, 1885) and has found its claim as an antiseptic to be well founded. We hope to be able to refer again to these experiments, which are not as yet concluded. (*New York Medical Record*, April 4, 1885.)

**Mode of Recognising Antipyretic Drugs in the Urine.**—Quinine gives a white precipitate with tannic acid ; with solution of iodide of potassium and mercury (Tanret) it gives an abundant yellowish white precipitate ; with solution of iodide of potassium and iodine a brownish yellow or chestnut brown. The presence of salicylic acid, carbolic acid, resorcin, and kairin is shown by the addition of solution of the perchloride of iron (no reaction with quinine), which gives rise to a reddish brown, wine-coloured, violet, smoky, or bluish colour. If, on the addition of sulphuric acid, the colour become clear red, kairin is present ; if the colour obtained with the perchloride disappear in the addition of sulphuric acid, salicylic acid or resorcin is present. Carbolic acid with nitric acid gives a blood-red brown colour and precipitate, with lively effervescence. Resorcin and salicylic acid are unaffected. Caustic potash added lastly in

excess gives a golden yellow flocculent precipitate with resorcin ; with salicylic acid the original violet colour partly returns. If the urine be diabetic, to avoid error it is well to boil it to drive off volatile products, such as acetone, which would falsify the reaction with the perchloride of iron. (*Rev. internaz. di Med. e Chirurg.*, iv. 1884.)

**Pathogenesis of Albuminuria.**—The object of Professor Tizzoni's experiments was to determine the behaviour of albumen of urine or of serous effusions when introduced into the circulation of healthy animals ; that is, to find out whether this albumen, either by virtue of its diffusibility or of its inassimilability, is again expelled from the body, or whether it is assimilated and consumed. To avoid the complication that would arise from injecting such a composite and unstable liquid as urine, the urea was removed by dialysis. The urine was procured from typical cases of Bright's disease, and was not injected until urea and bacteria were shown to be absent. The experiments were made upon dogs and rabbits. Some blood was allowed to flow before injecting the albuminous liquor, so that a transient plethora with a rise of blood-pressure might not be produced. The results in all the experiments (about twenty) were identical. The albumen never reappeared in the urine ; it became assimilated and was consumed. The same results were obtained with highly albuminous serous fluid taken from the peritoneal cavity of an albuminuric patient. The injections were made either into the veins or into the peritoneal cavity. That assimilation took place, was shown by the fact that a dog gained weight consecutively to repeated transfusions of these albuminous liquids into the peritoneal cavity, without the occurrence of albuminuria at any time. As a supplement to these experiments, the author wished to see whether discharged albumen introduced into the circulation is eliminated by the bile. To this end, he injected dialysed albuminous urine, or the serous fluid of albuminurics, into a large branch of the portal vein. He was never able, however, to detect albumen in the bile. (*Gaz. degli Ospitali*, Jan. 7, 1885 ; *London Medical Record*.)

**Cannabis Indica in the Opium Habit.**—Dr. J. B. Mattison recommends the fluid extract of cannabis indica in the treatment of the opium habit where the characteristic restlessness or insomnia is manifested after the withdrawal of the opium. Full doses are given and repeated every hour, second hour, or less often as may be required. Squibb's fluid extract is used, and sixty minims given at a dose, no unpleasant symptoms having ever been noticed, and Dr. Mattison considers that the small doses recommended in the books are useless. (*Canada Medical Record*, Jan. 1885.)

**Leukæmic Infiltration.**—It is still a debated point what signification is to be attributed to those leukæmic products which are to be found scattered in great quantity in the various organs of the body, and especially in the liver and kidneys; since by some observers they are regarded as a passive accumulation of leucocytes which have escaped from the vessels, and by others as the production of a continuous multiplication of their component elements. A series of observations which Bizzozero has recently instituted on specimens from three leukæmic subjects, seem to throw light on the problem. In both the infiltrated and nodular products which existed in the liver and kidneys, he found without exception that, among the accumulation of leucocytes, there were many which presented the various phases of multiplication by karyokinesis. These elements in a state of scission were shown to be in the tissue itself, and not in the vessels traversing it. The secondary leukæmic products may thus be very active foci for the production of white corpuscles; and, by means of these, the parenchyma producing this leucocytosis may be indefinitely extended, its invasion only being arrested by the death of a patient. For the demonstration of the karyokinetic figures, the author availed himself of the method which Gram recommends for the demonstration of microphytes; arresting, of course, the decolorising action of the alcohol before decolorisation is complete. (*Gaz. degli Ospitali*, Nov. 1884; *London Medical Record*.)

**Treatment of Ozæna.**—Dr. Loewenberg, of Paris, diagnoses ozæna by the inspection of the nasal cavities anteriorly and posteriorly, and by the microscopic examination of the secretion. The chief characteristic disclosed by inspection is the atrophy of the mucous membrane of the turbinated bones, causing an increased width of the nasal cavities, no ulcerative process being concerned in the production of the affection. Peculiar micrococci are found in the secretion, always large in size, and with a tendency to form into chains, and to exist in pairs; but in the unmixed secretion Dr. Loewenberg has never found any other kind of organism, except in one case of a child, aged 8, where bacilli were constantly present. The secretion was alkaline in all cases except the one just mentioned, where it was neutral. Dr. Loewenberg believes that ozæna can proceed only from an already existing case, when the germs given off meet with a suitable field in which to multiply, and the rarity of the affection shows the necessity for some form of predisposition. The general poor health of persons suffering from ozæna is referred to the effects of breathing constantly the air poisoned by the foul secretion, and of swallowing the secretion itself. Dr. Loewenberg points out the rarity with which aural

complications arise in ozæna, peculiarly interesting in presence of the fact that the opening of the Eustachian tube is especially exposed in consequence of the atrophy of the turbinated bones. He prefers the name "ozæna" to the longer and really incorrect one of "rhinitis chronica atrophica fetida," contending that it describes the affection beyond possibility of confusion, and that ordinary ozæna may be distinguished from syphilitic by the designation "simple" in contradistinction to "true." The forms of treatment which he recommends are the nasal douche and the nasal bath, both consisting of a very weak solution, 1 in 1000 to 1 in 700, of corrosive sublimate, the douche being administered carefully and gently with a syringe, and the bath serving to supplement the douche for the upper part of the cavities. As a more permanent disinfectant, some antiseptic powder, such as boracic acid, should be blown into the nostrils; care being taken during its aspiration, as also during the douche and bath, to close the larynx against its entrance by saying "ah," or by breathing through the mouth. The results of even this treatment may, however, only be palliative if the disease has made much progress before coming under treatment. (*Deut. med. Wochenschr.*, I. 2, 1885.)

**Cutanecus Regions of Special Sensation.**—During the past year three observers have investigated this subject independently of each other, and with remarkably concurrent results. Blix (*Zeitschrift für Biologie*, xx. 2, p. 141.) takes as starting-point Müller's law of the specific energy of nerves, that any irritation of a sensory nerve arouses one and the same sensation, whatever be the nature of the irritation. If this is true it follows that functional activity of any peripheral sensory apparatus produces always the same effect: that of exciting the nerve fibres to which it belongs. The kind of sensation which is thus aroused is dependent upon which nerve fibre conveys the irritation to the central nervous system, while the peculiar function of any given terminal sensory apparatus is, so to speak, selective, being capable of receiving only the one form of impression to which it is adapted. As is well known, there are methods of irritation which influence the nerve fibres themselves and which, therefore, in case there exists a specific energy of nerves, should be capable of exciting different sensations according as they affect different nerve fibres leading to central nervous apparatus possessed of diverse functional activity. If it were possible to apply such irritation so as to affect only a single primitive nerve fibre, the irritation should arouse the special form of sensation which is peculiar to the central apparatus of the irritated nerve, irrespective of the method of irritation employed. That the skin is the seat of several kinds

of terminal nerve apparatus is apparent, not only from its anatomical structure, but also from the many varieties of sensation which are perceived upon appropriate cutaneous irritation. These sensations are usually divided into three classes: sensations of pressure, of differences of temperature, and of pain. The question now arises as to whether the specific nerve structures in the skin are the same or different for different sensations, that is, whether the same terminal sensory apparatus is capable of transmitting different sensations. If the terminal nerve structures in the skin are different for different sensations, they must occupy different regions of the skin, and however near to each other they may be situated, it should be possible to excite isolated activity in only one of these organs or its attendant nerve fibre. Inspired by such reflexions, Blix adopted local faradisation of the skin as a means of irritation. One pole of an induction coil was attached to a flat, moist conductor of large size so as to be in contact with an extensive surface of skin, the other pole being in connexion with a small metallic point. By this arrangement the current of electricity, provided it is not too strong, is perceived only at the point of contact with the skin of the metal point. The use of a sufficiently strong current causes merely a generalised sensation of pain, while a milder current causes pain only in regions of the skin where the epidermis is thin, but not where the epidermis is thick. For purposes of experiment the most suitable strength of the electric current was found to be that which excited no feeling of pain when the pointed electrode was merely in contact with the skin, but only caused such sensations when the instrument was pressed firmly against the skin. In this way, by gradual increase of pressure, a gradually increasing irritation of the cutaneous nerves may be brought about. Contact of the electrode with the skin causes at first merely the sensation of pressure, provided the current is of the proper strength. By gentle increase of the pressure exerted, this sensation gradually changes to the characteristic feeling of pain caused by the application of the faradic current to the skin. Occasionally, however, the point of the electrode, while being moved about in contact with the skin, strikes a region where by gradual increase of pressure a well-defined sensation of heat or cold, most commonly cold, is aroused. By still further increase of pressure, this feeling of warmth or cold is transformed into the ordinary impression of pain, which assumes in different, although contiguous, regions of the skin different characters. Usually it consists of a sensation of burning or pricking, sometimes being, here and there, more dull and vibrating in quality. Electrical irritation, therefore, causes different sensations in different regions of the skin. In one place it excites only pain;

in another the feeling of cold ; in a third the sensation of warmth ; and in a fourth the sensation of pressure ; from which it follows that the kind of sensation is not dependent upon the nature of the irritation to which it is due, but upon the specific energy of the nerve structure which happens to be affected. The cutaneous regions which offer the most favourable conditions for promptly detecting these points of different sensation are the backs of the fingers and hands. Similar results are obtained by using merely a metal point without electricity. If a rounded point of cool iron or steel is slowly moved over the back of the hand, in contact with the skin, it arouses the sensation of cold only at certain points, while between these points are larger or smaller areas of skin where no such sensation is felt. Only when the instrument arrives in the neighbourhood of a region which is sensitive to cold is there perceived a slight feeling of cold, which increases in intensity as the metal point approaches the sensitive spot. Of course, the nearer such spots of cold perception are to each other and the thinner the epidermis, the finer must be the metallic point which serves to differentiate them. In regions of the body where they are more *discrete* and where the epidermis is thick, it is necessary to use a more blunt and colder instrument in order to detect them. By the application to the skin of a metal point which could be kept at any desired degree of heat, the author discovered that there also exist in the skin certain spots which are affected only by the application of heat, and that these spots are separate from, and do not coincide with, those at which the sensation of cold is perceived. As a rule the cold points are more numerous than the warm points and both kinds are most thickly grouped upon the backs of the hands and fingers, less so upon the face, while upon the arms they are less numerous and upon the legs are quite sparsely situated. Upon the legs, for instance, there are cutaneous regions, of several square centimetres in extent, which are non-sensitive to both heat and cold. These points of special sensation are irregularly distributed and without definite arrangement, save that on the backs of the hands and fingers they are more thickly grouped than elsewhere. The thicker the epidermis the more difficult is their detection ; but even on the palmar surface of the hands and fingers it is possible to demonstrate their separate and individual existence. Goldscheider (*Monatshefte für prakt. Derm.*, Nos. 7, 8, and 9, 1884, and *Vierteljahrsschrift für Derm. und Syph.*, 3 and 4, 1884) has arrived at practically the same conclusions as Blix, but is of the opinion (*Monatshefte für prakt. Derm.*, No. 1, 1885) that these cutaneous regions of special sensation have a more or less definite arrangement, the principle of which is as follows : They are disposed in straight or slightly curved lines which radiate

from certain points in the skin. By reason of the fact that the lines radiating from different points cross each other, there ensue enclosed areas of skin in which no points of special sensation exist. The central points, from which radiate the spots sensitive to differences of temperature, also serve as radiating centres for the spots sensitive to pressure, and as a general rule these central radiating points are situated directly over the hair papillæ, but even in hairy regions of the body there are also to be detected central points of radiation which bear no such relation. Donaldson, of Johns Hopkins University, using thermal stimuli, has found that the distribution of sensitive spots in corresponding parts of the body differs in different individuals; that in the same individual the disposition in symmetrical regions of the skin is different; that the number of points sensitive to cold is greater than that of the points sensitive to heat; that the relative abundance of the two kinds varies in different parts of the skin; and that in a general way there are two grades of each kind of sensitive points—that is, those which react almost always and those which react less than half the time, and in which the sensation is comparatively faint. He finds that the spots are very small, as a rule less than a millimetre in diameter; that their power of perception is easily exhausted, and that the sensation called forth by a single stimulus often lasts for some minutes after the removal of the stimulus. That these points of special sensation are situated in the skin and not beneath it is shown by the fact that they move with the skin. To determine whether any definite histological peculiarity could be detected in the anatomical structure of these spots, two such regions of skin, one sensitive to heat and the other to cold, were excised and subjected to microscopical examination. No special structure, however, could be found which might have any association with the special sensitiveness of the spots, while experiment further demonstrated the fact that cicatrices are also possessed of regions of special sensation. Eulenberg (*Monatshcfe f. prakt. Derm.* 1, 1885) has been investigating cutaneous sensibility as to differences of temperature, with an instrument composed of two thermometers, adjusted after the manner of the two points of an æsthesiometer, and so arranged that one thermometer could be heated to any desired degree. He finds that he is in a position to "confirm the conclusions of Goldscheider, so far as they concern cutaneous sensibility to heat and cold, in almost every essential particular." (*Boston Med. and Surg. Journal*, May 7, 1885.)

**Infectiousness of Phthisical Sputa.**—Prof. S. Sirena and Dr. B. Pernice have lately made a series of investigations upon the transmissibility of tuberculosis by means of the sputa of

phthisical patients. Their experiments were performed with great care as to details, and lead to the following conclusions: (1) The liquid obtained from the evaporation of tuberculous expectoration is constantly free from the bacilli of Koch, and, when injected into the cornea, subcutaneous cellular tissue, or into the peritoneal cavity, as a general result, produced neither local nor general tuberculosis. (2) That phthisis-producing bacilli are not found in the surrounding atmosphere, as a result of evaporation of tuberculous sputa, though such organisms may be very abundant therein. (3) Respiration for several hours, or for a protracted period of several days, in a close atmosphere in which are contained the exhalations from phthisical sputa, does not produce tuberculosis in animals. (4) Animals confined in close quarters and compelled to breathe an atmosphere laden with the dust of dry tuberculous sputa, do not contract tuberculosis. (5) The subcutaneous injection of tuberculous matter produces for the most part a local specific manifestation, as is shown by the presence of tuberculous bacilli in the pus of the lesion, and after a variable time produces tuberculosis of the abdominal or thoracic organs. (6) The injection of tuberculous sputa into the peritoneum, produces first a local, and secondarily general tuberculosis in animals. (7) Tracheal injection of a solution of tuberculous sputum, even in animals affected with broncho-pulmonitis, is not the cause of a specific infection, but for the most part of septic croupous pneumonitis characterised by the presence of micrococci on the exudation. (*Gazzetta degli Ospitali*, March 29, 1885.)

**Cutaneous Administration of Salicylic Acid.**—Dr Randolph and Mr. Samuel S. Dixon call attention to the fact that when salicylic acid is applied to the uninjured skin, rubbed up in a thin paste with olive oil, the drug is absorbed, and its presence can be demonstrated in the urine. Considering that the internal administration of salicylic acid and its salts is not infrequently capable of producing gastric irritability, the advantages of inducing its cutaneous absorption—if these observations are confirmed by other practitioners—are apparent. In some of the six cases reported in which this method was used with relief, with one exception, twenty grains of the acid were rubbed into a paste with olive oil, and gently smeared in each axilla. In another case the acid and oil (3ij to 3j) were spread upon absorbent cotton, and the whole gently wrapped around the knee. (*New York Medical News*, February 14, 1885.)

**Transplantation of Muscle.**—Dr. Eduardo Salvia, in an experimental study upon the transplantation of muscle, and the regeneration of muscular fibre, sums up the results obtained as follows: (1) It is possible to transplant a portion of the

muscular tissue of one animal into that of another, difference of species having no effect upon the result. (2) The transplanted portion of muscle may unite completely with the muscle with which it is brought into relation by first intention. To obtain this result, it is necessary that the transplanted muscle completely fills up the void made by the retraction of the excised muscle, and that the operation be conducted under strictly antiseptic conditions. (3) The union between the transplanted muscle and that of the animal upon which the operation is performed takes place from the formation of new muscular fibre, which is produced without leaving trace of the original points of separation. (4) The muscular fibre which is introduced gradually loses its own special anatomical peculiarities, and acquires those of the living animal, to the degree that after a time the most careful microscopic examination is unable to detect a difference between the original and acquired muscular tissue. (5) The function of the muscle after its introduction in a relatively short period is perfectly restored, without the slightest tendency to weakness or stiffness. (*Gazzetta degli Ospitali*, March 22, 1885.)

**Cocaine in Obstetrics.**—Dr. Alphonse Herrgott, after a comparative study of many reports concerning the use of hydrochlorate of cocaine in obstetrics, and after numerous experiments of his own, in which the effects of the drug were carefully noted, reaches the following practical conclusions as to its value:—(1) Sensibility to pain was always very markedly diminished. Only moderate pain was felt, which was almost *nil* in superficial parts and much diminished in the deeper tissues. (2) Cocaine also entirely anaesthetises an inflamed mucous membrane, as is shown by its effects in vulvitis and acute gonorrhœal vaginitis. (3) Reflex vaginal excitation is diminished by application of the drug. The preceding effects having been noted, the general indications for the use of cocaine may be summarised as follows:—(1) *To produce anaesthesia.*—(a) Before extensive cauterisation of the vulvar or vaginal mucous membrane, or before the application of caustic or concentrated solutions of corrosive sublimate. (b) Before the removal of small superficial vegetations of the vulvar mucous membrane: for example, in condylomata or caruncles of the urethra. (c) In excitable patients, in cauterisation of the uterine neck or previous to the use of the curette in the uterine cavity. (2) *To diminish reflex excitement.*—(a) In case of temporary vaginismus, before the touch, or introduction of a vaginal speculum, or even by the patient herself before coitus. (b) In case of spasm of the rectum and anus occasioned by fissure, either for operative procedures without general

anæsthesia, or for the relief of pain during defæcation. (*Annales de Gynécologie et d'Obstétrique*, February 1885.)

**Permanent Solution of Hydrochlorate of Cocaine.**—In discussing the pharmacy of this new drug, Dr. Squibb (*Ephemeris*, January 1885) states that its solutions, like those of most alkaloids, are all liable to deteriorate by the growth of microscopic plants, which are nourished by the alkaloid, and therefore destroy it. These growths commence usually within a week, and when once started they increase rather rapidly. As the salt will always be used in solution, and as many persons will not take the time and trouble for even so small a matter as the making of accurate solutions, it becomes highly important to fix upon a definite standard strength of solution for ordinary uses, and to have this securely protected against change in keeping. There are several agents which prevent these growths in alkaloid solutions, and among the most effective are carbolic acid, salicylic acid, boric acid and the aromatic series. A small proportion of ether often prevents the growths, and as this seemed least objectionable here, it was tried, but failed, until the proportion was so large as to be irritating to mucous membranes.

All the protective agents tried were found somewhat irritant, even in dilute solution, and in selecting the one which seemed least irritant, and which was effective in the smallest proportion, salicylic acid was adopted. An incidental objection to this acid is its extreme sensitiveness to the presence of very minute traces of iron. Almost all filtering paper contains iron enough to react with salicylic acid, and in handling extracts, alkaloids, &c., it is not easy to avoid the use of steel spatulas, tinned iron funnels, &c. Hence it is that a very nearly or quite colourless solution of hydrochlorate of cocaine, when mixed with a very dilute solution of salicylic acid, will, either at once or in a few hours, in proportion to the amount of iron present, become very sensibly deeper in tint, and of a reddish-brown tint. As no possible harm can come from this tint, and as a tinted solution is just as good as a colourless one, this objection to salicylic acid was not considered of sufficient weight to cause it to be rejected. Boric acid seemed to be a much better protective agent, in that its effects upon mucous membranes—of the eye, for example—are not at all irritant, but, on the contrary, are sedative. But it is a much less certain protective, and is required in so much larger a proportion than salicylic acid that it was not thought safe to adopt it.

At ordinary temperatures 1 part of salicylic acid is held in solution by about 300 parts of water, and it is good practice to keep such a solution standing upon some undissolved crystals for use in protecting solutions of the alkaloids for hypodermic

and general use. In making up the solutions of alkaloids, a good rule is to take one-half water and the remainder of the solution of salicylic acid, as the solvent. This gives to the solution of the alkaloid salt about one six-hundredth part of salicylic acid—a proportion that can hardly be objectionable in any way, and yet is sufficient to protect the solutions indefinitely. (*Pharmaceutical Journal*, March 28, 1885.)

A recent writer on this same subject states that camphor water is an excellent solvent of cocaine, and also makes a permanent solution. He also found that solutions of this drug are most active when neutral or slightly basic, and that an acid hydrochlorate of cocaine, though more soluble, is less effective. (*Glasgow Med. Journal*, April 1885.)

**Cocaine in Chronic Pharyngitis.**—Dr. Jahn recommends the following formula for the relief of the cough and vomiting of chronic pharyngitis:

Rx.—Cocaine . . . . .	gr. iss.
Glycerine . . . . .	f <small>z</small> iv.
Aqua destillatae . . . . .	f <small>z</small> x 5ij.
Acidi carbolici . . . . .	gr. $\frac{1}{6}$ .—M.

S.—Apply morning and evening with a suitable brush. (*Gazette Médicale de Paris*, March 14, 1885.)

**Sponge-grafting in Varicose Ulcer of the Leg.**—Dr. J. A. Francis writes:—The most common cause of ulcers of the leg is undoubtedly the presence of one or more varicose veins. Very often the affected leg or legs may appear at first sight entirely free from them, but a minute inspection will generally reveal a small varicose vein leaving the ulcer at its upper edge. The scars left by varicose ulcers are generally pigmented, and might be called copper-coloured.

With regard to the treatment of these ulcers: the system is nearly always low; tonics are, therefore, indicated. I have always found that good bottled “cooper,” which is as cheap as bad draught beer, was as good a tonic and agreed better with the stomach than simple stout. The local treatment with Martin’s bandage and sponge-grafts, which I shall describe presently, I have found very successful. Several of my patients had already tried rubber-bandages and given them up, but all of these are now wearing them, although their ulcers are cured. The medical man ought himself to bandage the leg evenly and not too tightly from the roots of the toes upwards, nearly covering the heel, to just below the knee, several times, so as to thoroughly instruct the patient how to do it. When the patient can do this properly, the bandage should be applied before getting off the bed in the morning, and should not be taken off until after

going to bed at night. The bandage ought to be washed with cold water every two or three days. With respect to the sponge-grafts, I prepare mine in the following manner. Using a fine piece of new sponge, which I always keep in a bottle of weak solution of carbolic acid, I cut off a piece from the outside with a pair of sharp scissors, so as to make a smooth surface. I then pinch up the sponge in a pair of dressing-forceps, so as to leave the pinched up smooth surface a little above the edge of the forceps ; this I cut off with a sharp razor, and so get a very thin section of the sponge. When dry, a number of these sections may be conveniently carried in an envelope in a pocket-book. The way to apply one is to damp it first, and then to cut it to the shape of the ulcer, but a little smaller. It should be laid smoothly on the ulcer, a piece of soft rag placed over it, and the bandage evenly put on over all. The sponge will adhere in a very short time by the growth of granulations between its interstices. Should it not be painful or offensive, it may be left on till it falls off with the scab, or is absorbed. Sometimes, however, in a few days it is painful from the confinement of discharge. It should be taken off, a warm linseed-poultice applied to clean the wound, and a fresh piece of sponge applied as before. The wound will, however, be found to be smaller after each application until it is healed. I was at first afraid to apply the sponge to ulcers which appeared irritable. I found, however, that the sponge suited them equally well ; and I should not now hesitate to apply the sections to any ulcer.

In the treatment of these varicose ulcers, and indeed of varicose veins in general, experience has taught me that the patient should always sleep with his heels higher than his head. This may be effected by putting blocks of wood under the legs of the bedstead at the foot. It is of no use whatever to put pillows etc., under the foot of the mattrass. (*British Med. Journal*, April 25, 1885.)

**The Treatment of Fever as a Symptom.**—While the chief object of all medical treatment is necessarily to eradicate disease by attacking its very beginnings, there are times in which the relief of a pressing symptom may constitute the first important step towards recovery. Fever is such a symptom. How often does one find that, even in the presence of an active morbid cause, the mere remission of temperature for a certain period assists the physician, by obtaining rest for his patient, by gaining time, by quieting irritability in the neighbourhood of a source of mischief, and so converting an acute into a subacute or chronic process. These effects appear in many diseases which are said to run an unvarying course—in typhoid fever and early tuberculosis, for example ; and there are good physiological

reasons why the abatement of fever in itself should materially aid and tide over other efforts of nature or of art which are designed to cut the root of unhealthy action. It becomes, therefore, a matter of interest to enquire in what way a fall of temperature can thus react upon the local processes which determine the course of fever, and that fever does depend on local causes may probably be accepted as an axiom. All its features tend to show that it is a nervous disorder which acts along the lines of the vaso-motor system, that its method is reflex, and its results a destructive metabolism, which reveals itself in general emaciation, and is most intense at the original seats of morbid irritation. The aim of antipyretic measures must therefore be to allay this nervous overwork by opposing a buffer to the repeated shocks of peripheral stimuli, and this may clearly be accomplished in more ways than one. Thus it is frequently possible, by using narcotics, to lull the excited cerebro-spinal centres generally, and so to weaken their response to provocation. By another agency the constricting influence of the vaso-motor centre may be specially and directly inhibited and the circulatory system proportionally eased, as would seem to be the case when salicylates are employed. In this case, also, the harassed nervous centres share the general rest. The heat-regulating mechanism, too, if it exist as a separate factor, may be restrained by similar means, when its disordered forces would otherwise result in riotous excess of tissue change. In any case, the reduction of fever, besides preventing general loss of power and substance by wasteful molecular action, is directly beneficial in another way. By depleting areas which border on the causal irritant or its habitat, and the intense congestion of which magnifies the force of stimulation, it must react as a sedative at the very source of disease. These observations suffice to show why antipyretics possess a real value even in such diseases as continuous fevers. Apart from the aid they render to the further resources of medical skill, and apart from their action on septic germs, they often appear, by the rest which they procure alone, to constitute the chief element in the cure of febrile disease. (*Lancet*, June 6, 1885.)

**The Urine in Lesions of Bones.**—The condition of the urine in osseous lesions has been studied by M. Verchère, who has formulated the following propositions. The facts have been arranged into two divisions according as the lesion is traumatic or inflammatory. The traumatic class is further subdivided into three groups. In the first group the osseous fractures were produced by insignificant causes, and examination of the urine showed that the discharge of phosphoric acid was much above the normal; consolidation of the fracture was not

hindered by this excess of phosphates. The second group is composed of cases of fracture in which union was retarded; in these there was polyuria. In the third group there was delayed union with phosphaturia, which preceded the fracture and appeared to cause it. In inflammatory osseous lesions phosphaturia is the sign of a peculiar state of the system. (*La France Médicale*, May 7, 1885.)

**Creasote Water as a Local Anæsthetic.**—Dr. E. R. Squibbs writes: The officinal aqua creasoti, or creasote water, is so important as a preparation for one special use that it is well to notice it in order to emphasise that special use. It is a simple one per cent. solution of wood creasote in water, and, like similar solutions of carbolic acid and of cresol, it is a most effective local anæsthetic and topical dressing to burns and scalds. It is no better than the solutions of carbolic acid, or of coal-tar creasote, for this purpose, but it is quite as good, so that whichever is most accessible or most convenient may be used. This creasote water, as made by the above formula,—or diluted with an equal volume of water, or with more water for delicate surfaces in women and children,—and applied by means of a single thickness of thin muslin, or worn-out cotton or linen, such as handkerchief stuff, and the application renewed from time to time, as the return of pain requires it,—will relieve the pain of burns and scalds in five to ten minutes, and will maintain the relief as long as the applications are properly renewed, or until the painful stage is over. It is also very effective as a local anæsthetic for general use in all painful conditions which affect the surface only, such as the pain of erysipelas. The benumbing effect of these phenols upon the skin is very promptly reached, and can be carried to almost every degree that is desirable, by simple management of the strength of the solutions and the mode of application. They are true anæsthetics to the skin, while the much-lauded cocaine is not. This statement has been published so often during the past twenty years, and the treatment has been so effective in so many hands, that it is wonderful to notice how the common practice is still to use the old and comparatively useless hot dressings, such as carron oil, white lead ground in oil, flour, liniments, etc., or the newer application of solution of bicarbonate of sodium. (*Ephemeris*, March 1885.)

## Notes and Queries.

THE "INDEX MEDICUS."—(*From Trübner & Co.'s American, European, and Oriental Literary Record.*)—We are pleased to announce that this valuable serial will be continued under the auspices of Mr. G. S. Davis, of Detroit, Michigan, a publisher of considerable experience, who also issues the *Therapeutic Gazette*, the *Detroit Lancet*, and the *Medical Age*. The thanks of the medical profession are due to Mr. Davis for coming forward and taking up a periodical which up to the present time has not been commercially remunerative, and we hope that Great Britain and the Continent will come forward with subscriptions, and so help Mr. Davis in his efforts to make the periodical self-supporting. It is needless to say that, were the editors remunerated for their labours, it would be utterly impossible to publish it. The following *résumé* of the aims and objects of the *Index Medicus* will not be out of place at the present juncture.

The *Index Medicus*, now in its seventh year, records the titles of all new publications in Medicine, Surgery, and the collateral branches, received during the preceding month. These are classed under subject-headings, and are followed by the titles of valuable original articles upon the same subject, found, during the like period, in medical journals and transactions of medical societies. At the close of each yearly volume a double index of authors and subjects is added, forming a complete Bibliography of Medicine for the preceding year.

Few words are required to demonstrate the utility of this serial. In its pages the practitioner will find the titles of parallels for his anomalous cases, accounts of new remedies, and the latest methods in therapeutics. The teacher will observe what is being written or taught by the masters of his art in all countries. The author will be enabled to add the latest views and cases to his forthcoming work, or to discover where he has been anticipated by other writers, and the publishers of medical books and periodicals must necessarily profit by the publicity given to their productions.

Dr. Billings has for some time been engaged in preparing an Index-Catalogue of the Library of the Surgeon-General's Office at Washington, D.C., including under each subject-heading, not only the separate books, but all important original articles in medical periodicals and transactions of all countries. This Catalogue has now been issued up to the fifth volume.

It was highly desirable that such a Catalogue should be supplemented by some current publication, showing all recent works, with articles in periodicals *arranged by subjects*, but until 1879 no proper means were available for such an undertaking. The late Mr. F. Leypoldt, of New York, undertook the publication of this medical bibliographical serial, upon the condition that the manuscript for it was furnished of the requisite completeness and accuracy, and this last Dr. Billings has supplied.

All books, pamphlets, and periodicals sent by their authors or publishers to the *Index Medicus* will, after record and analysis, be placed in the Library of the Surgeon-General's Office: and the hope that the contributions to the Library from this source will be large, and thus permit of the application of the limited fund provided by Government for its support to the purchase of the many works still required for it, has been Dr. Billings's main inducement to furnish the necessary data. Beyond the satisfaction of thus contributing to the convenience of the medical world, and to the completeness of the Library under his charge, he has no personal or pecuniary interest in the enterprise.

In the details he has been assisted by Dr. Robert Fletcher, M.R.C.S.E., who has been for some time past on duty in the Library of the Surgeon-General's Office, is perfectly familiar with its methods, and is in every way specially well qualified to manage the editorial part of such a publication.

All medical men who approve of the object for which the *Index* is issued will, it is to be hoped, put their approval into practical shape, by doing two things, viz.:—1st, subscribing promptly for the *Index*; and 2nd, taking care that a copy of every book, pamphlet, etc., of which they are the authors is forwarded to the editors.

It is also hoped that all publishers of medical works, large or small, will see that it is to their interest that each of their publications is promptly sent to the editors in order to secure an early and accurate priced record in the *Index*.

Office of the *Index Medicus*—Detroit, Michigan; and London, Trübner & Co., 57 and 59, Ludgate Hill.

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\*.\* Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C.; WILLIAMS and NORGATE, of Henrietta Street, Covent Garden, W.C.; or BAILLIERE, of King William Street, Charing Cross.

## Department of Public Health.

### THE MALARIA OF THE TRE FONTANE.<sup>1</sup>

BY C. TOMMASI-CRUDELI.

*Professor in the Royal University of Rome.*

[REFERRING to his last communication to the Academy,<sup>2</sup> Professor C. Tommasi-Crudeli says he has been unable to continue his studies at Rome during the years 1881-2 from want of material.]

It would seem that the great dryness of these two summers in the Agro Romano, and the notable diminution of temperature which took place when the autumn rains began, have limited the development of malaria in this district, not only in 1881 but in 1882. In 1880 the number of patients suffering from grave malarial fever in the hospitals of Rome was sufficiently great to enable a very large number of observations to be made in a comparatively short time upon the blood of the living and the internal organs of the dead, but from that time to the present the number of fever cases has been few, and of these by far the greater part have been relapses or slight cases of primary infection.

Despite this exceptional relative healthiness of the Agro Romano, in 1882 a grave epidemic of malaria broke out in a limited area of it, viz. at Tre Fontane (Three Fountains).

Every one knows that there is here a monastery of Trappists, who for many years have taken in hand the improvement of the agricultural condition of the adjacent land by drainage, and by

<sup>1</sup> *Reale Accademia dei Lincei*, Anno cclxxx. 1882-83 (*Trans.* 5, vii.).

<sup>2</sup> Cuboni e Marchiafava, *Nuovi Studij sulla Natura della malaria. Memorie delle Classe di Scienze fisiche*, ecc. vol. ix.

plantations of vines and eucalyptus. Parallel with this improvement of the land it appeared that there was an improvement in its hygienic conditions, *i.e.* a diminution in the intensity of the malaria of the locality; this good effect was attributed by most people to the plantations of eucalyptus and to the use of a preparation of eucalyptus made by the Trappist monks, and so suggested the idea of an extension of this special cultivation. Close to Tre Fontane was a holding of 495 hectares, belonging to the Society of the Sisters of the Blessed Sacrament. An association of fifty families of peasants had already entered into negotiations for renting this land with the idea of creating in this place a "cultivated centre" ("centro abitato") according to the prescription of the law for the improvement of the Agro Romano, but the *Giunto liquidatrice dell'asse ecclesiastica* refused to consider their proposal, and handed over the estate to the Trappists with the idea of instituting an experiment on the beneficial effect of the eucalyptus on a large scale. In order to facilitate this experiment a colony of convicts was established close to the convent, *i.e.* in that part of the estate which every one believed to be already made healthy by the eucalyptus.

The hygienic conditions under which the convicts were placed as regards hours of work, housing, and food, were better by far than those under which the agricultural population of the Roman Campagna usually live.

Despite this, hardly had the fever season of 1880 begun, than almost the whole of the members of the penal settlement fell sick of malarial fevers more or less grave. The notion then rooted in the public mind, that it was possible to live at Tre Fontane in the bad season without risk—thanks to eucalyptus and the liqueur prepared by the monks from it—caused the founders of the colony to neglect many of the ordinary precautions which should have been taken; hence one had to deplore a number of victims even among the prison guards. The fact was at first denied, and then, when it was no longer possible to do so, an attempt was made to explain it by saying that in that year the malaria had manifested itself on an unusual scale in the Campagna, and that the atmosphere of Tre Fontane had been exceptionally poisoned by infected air from the surrounding localities; at all events it was thought fit to .

adopt greater prudence in 1881, and when in 1882 it was desired to repeat the experiment of this colony on a grand scale, every reasonable precaution was taken, and means provided for the immediate assistance of any who might be attacked.

In the summer and autumn of 1882 every single inhabitant of Tre Fontane was attacked ; amongst the monks the cases were slight, but none escaped. Some of the convicts also had only mild attacks, but many others had it in a very severe and some in its severest form (*grave e gravissima*), and after having been cured had to be sent to the baths at Civita Vecchia and Spoleto to recover their strength ; almost all the guards were attacked by the fever in its gravest form, and had to be sent away. There were no deaths, because the medical assistance was prompt and well administered ; three kilogrammes of quinine were used during this epidemic. One death did occur in the case of a convict, previously seriously ill from a severe chronic disorder. Nevertheless, in spite of all the care used, there was the usual cachexia among the patients which follows severe Roman fever, and for a long time after the cure of the febrile attacks the proof of this remained in the anaemic condition of most of the convicts and almost all the guards.

These facts induced the medical officer of the colony at Tre Fontane to propose that in future the work should be suspended in the most malarious season, and at a sitting of the Chamber of Deputies, January 22nd, 1883, repeated this proposal to the Minister of the Interior, laying special stress upon the miserable condition in which the fever leaves the prison guards. These, in fact, invariably suffered more seriously than the convicts, as well in 1880 as in 1882. Perhaps the inactivity to which their duty compels these men during the long hours of labour of the convicts serves to collect in their organism a greater quantity of the malarial poison through the inspired air, while the convicts on the other hand are continually getting rid of considerable quantities, thanks to the state of activity in which their labour-maintains their circulation, and to the abundance of all the secretions of their bodies which results from it. Whatever it may be it seems unjust that these men should be exposed to the risks of contracting a disease which will leave

its mark upon them for life, in a service which is not the service of the State.

As a matter of fact, many circumstances to which it is not proper to refer here have taken away from the works at Tre Fontane their character of an agricultural experiment undertaken in the public interest, and have caused it to assume that of a private agricultural industry, under exceptional conditions of prosperity, worked for the sole benefit of the Trappists. We must remark the singular contrast presented by the sanitary state of the whole Agro Romano in 1882, and the great development of malaria which took place in this plague-stricken spot in it, which so many both in Italy and abroad declared to be already cured by eucalyptus plantations and a wisely-conducted high cultivation, and it cannot fail to strike all those in Italy who are interested in the vital question of the improvement of malarious soils.

After having drawn attention to these facts, above stated, I considered it my duty, in my double capacity of Professor of Experimental Hygiene in the University of Rome, and of member of the Municipal Sanitary Commission, to call the attention of Signor Berti, Minister of Agriculture, Industry, and Commerce, to them. I therefore addressed to him a letter on November 8th, 1882, in which I set forth precisely what had occurred, and prayed him to nominate a commission of competent persons to examine accurately the estate of Tre Fontane, and seek the reasons for the extraordinary outbreak of malaria.

This time there was no room for the belief, as in 1880, that it had been caused by currents of infected air coming from the surrounding country. Signor Berti showed himself disposed to undertake the inquiry, which has a great scientific and economic interest, and I think that until it has been completed it will be well to abstain from any conjecture as to the cause of this severe but limited epidemic.

The facts are, however, practically instructive, proving as they do once more to what risks of mistake we expose ourselves if we hold *a priori* that the methods which have resulted in a permanent improvement of one malarious locality can be usefully applied to all.

*The condition of such a permanent improvement is that of so*

*modifying the physical conditions and the chemical composition of the soil as to render it incapable of producing the malarial ferment.*

If all malarious soils were similarly situated, and had the same chemical composition, we should be certain of obtaining a permanent improvement in them, by the adoption of a system of cultivation by which this result had been brought about in any one of them; but unfortunately malaria is produced in soils whose situation and chemical composition is most various, so that the system by which some have been improved may fail entirely when applied to others. So with the plantations of eucalyptus, they succeed in one place and not in another. Even quite recently an inspection ordered by the French government in Algeria proved that entire woods of eucalyptus have not produced the slightest effect upon the hygienic conditions of certain malarious localities, whilst in others some benefit would seem to have accrued. Besides this, in Italy and also in Algeria (where the climate is much more favourable than ours to the growth of eucalyptus), these plants, which belong to the southern hemisphere and are there in full vegetation during the winter, are most capricious in the northern hemisphere, and sometimes whole woods of them which have flourished for years, perish in consequence of intense cold in winter, of frosts delayed into the spring, from cold and wet combined, and from other causes as yet not well determined by the botanists.

The same may be said of high cultivation. We are accustomed to judge of its useful effect on malarious soils entirely from what we know to have taken place in ancient times in many parts of Italy and Greece, which became healthy as the result of high cultivation practised for centuries. In other places, however, as for example at Selinunto, Agrigento, and Sibari, a healthy soil has never been obtained despite this cultivation of centuries. The same uncertainty of results obtained has been found in our times as well in Europe as in America.

We know nothing precisely about the nature of the cultivation which should be adopted in order to produce in a given species of malarious soil a final modification of its physical conditions and chemical composition which shall render it incapable of producing the poisonous ferment. At present we are feeling

our way, with the result that often we obtain useful results by means of high cultivation and as often not; sometimes it happens that some varieties of cultivation, instead of improving the hygienic conditions of a locality, positively make them worse. And lastly, after a long series of practical experiments, which have not furnished a positive solution for any special case, we find ourselves exposed to the painful surprises of which the improvements undertaken at Tre Fontane are an example.

To render more easy and less dangerous the practical experiments which are already in progress, and which may be suggested for the advancement of our scientific knowledge of the subject, the search for means of increasing the resisting power of the organism must be insisted upon, so that the agriculturists may be put in a position to combat the attacks of malaria. An experiment on high cultivation is of necessity a long affair, and cannot under the best circumstances be fairly carried out unless one can secure the presence of the labourers on the spot during the whole year, they *being protected* from the malaria during the bad season. This latter is a duty imposed upon us by every consideration of humanity and public interest, seeing that even in the actual state of affairs the physical degradation produced by the malaria in some of the races of Italy is most serious, although a great part of our population withdraw themselves from the danger by emigrating from malarious localities during the summer, or, what is still more to be regretted, emigrate to foreign countries, from those inhospitable districts of Italy where they run the risk of dying either from hunger or fever.

Supposing that we set aside, as many are disposed to do, the humanitarian question, and confine ourselves purely to the economical one, it is clear that no proprietor can repeat an experiment on high cultivation in a locality where pernicious fever prevails, at least in the same form as that undertaken at Tre Fontane.

The government provided the Trappists with manual labour at an exceedingly low rate, even during the most dangerous season of the year, and besides this took upon itself all the expense of providing good housing and hospitals and excellent medical assistance, and the care of those who were struck down by fever during their convalescence.

No proprietor could repeat an experiment in this form, although it might be certain that after some years his lands now unhealthy and yielding little might become healthy and yield much. Therefore if we wish practically to solve the question of the improvement of Italian soils, we must as far as possible prevent the infection of individuals who are obliged to live on the soil to be improved.

After many attempts to obtain a mode of preserving man by means which shall cost but little, be harmless and easy to use, I concluded as the result of many observations made in 1880 that we ought to give preference to arsenious acid and the alkaline arseniates. In a preliminary note presented by me to the Academy, I set forth my intention of pursuing these observations in succeeding years—and this has been done by the intelligent co-operation of Cav. dott. Ricchi, chief medical officer to the southern railways, and of some great proprietors in the course of the years 1881 and 1882. The results obtained in 1881 were satisfactory enough, but I did not attach much importance to them because in that year the development<sup>2</sup> of malaria in almost the whole of Italy was at a minimum, and it would have been easy to attribute the immunity claimed to have been obtained from the use of arsenic to the general feebleness of the specific infection. But during the summer and autumn of 1882, in many places in central and southern Italy endemic malaria was serious, and facts were obtained<sup>1</sup> which seemed to justify the hope expressed by me in 1880 that arsenic was a preservative both useful and easy of application. I have undertaken to represent these facts in a memorial to the Minister of Agriculture, Industry and Commerce, and shall have the honour to submit it in brief to the judgment of the Academy.

<sup>1</sup> See *Practitioner*, xxxv. 37.

# THE PRACTITIONER.

AUGUST, 1885.

## Original Communications.

### NOTES ON THE USE OF ANTIMONIALS.

BY J. B. NIAS, M.B., M.R.C.P.

ANTIMONY is not at the present date a favourite drug. I have very rarely seen it used, and perhaps should never have been led to use it myself, if I had not read the *First Principles of Medicine* of the late Dr. A. Billing, a text-book, old-fashioned now in its terms, and in its references to physiology, but still a most excellent clinical guide. Dr. Billing's favourite prescription was a combination of tartar emetic with sulphate of magnesia. It is still official in the St. Bartholomew's Hospital *Pharmacopeia* under the name of Haustus antimonii cum magnesiae sulphate: little used of late years, it was near to being left out, as I learn from Mr. Jeffs, at the last revision. This was the first preparation that I used. From old out-patient letters I find that the first cases in which I employed it were those of patients suffering from acute pleurisy. There come to St. Bartholomew's, as to all London hospitals, numbers of such from amongst water-side labourers, stokers at gasworks, and others, who are in their work exposed to vicissitudes of temperature; complaining, as is usual, of cough, more or less fever and pain in the side, the latter being pretty severe and the chief cause of their seeking relief. These men (they are mostly males) are unwilling to lie up; they are not, as a rule, fit cases for admission as in-patients; and of

any remedy that hinders them from work, such as strapping their sides with plaster, they are singularly impatient. In short, one has to try and cure them while letting them go about their work. Viewed by the light of what is expected in private practice, this may appear futile. If one sets to work rightly, it is not so. At the same time, one must be prepared to have failure punished by the presence, at the next visit, of a pint or more of fluid in the pleural cavity : so that inconsiderate treatment, or, what has happened to me, failure in diagnosis, entails considerable trouble. I quote a case combining both faults :—

On September 20th last there came to me, at the Western General Dispensary, W. R——, aged fifty-nine, a strong, healthy, temperate man, employed at a coal wharf on the Paddington canal, complaining of a slight cough without expectoration, great tenderness over the area of the right mamma, pain on moving the arm, and a stitch on drawing a deep breath. He thought that he had strained himself when pushing a barge along the canal with a pole, which rested against his right shoulder. No pleural friction-sound was detected ; nor any morbid sound in the lung. Questioned, he thought that he might have been chilled while sweating, but did not remember anything of the kind. Though there were no marks of injury, I accepted his version : and, as he was very unwilling to lie up, confined myself to ordering belladonna liniment to the side ; and a draught three times a day containing 120 grs. of sulphate of magnesia, 20 ms. of liquor morphiæ acetatis, and f 5 i. of liquor ammoniæ acetatis. Not, perhaps, very erroneous treatment : still, if I had recognised the case as one of pleurisy, I should have prescribed otherwise. On September 27th I saw him again. He had been at work all the week, but the pain had compelled him to knock off on one day. His appetite was bad : otherwise he professed himself easier. I examined his side, and noted a friction-sound in the right axillary line at the fifth intercostal space : nothing more. Puzzled, but persisting in my previous diagnosis, I repeated the liniment, changing the medicine for a draught containing 1 gr. of quinine and 3 grs. of iodide of potassium three times a day. When next I saw him, he had an effusion into the right pleura up to the level of the nipple. I will not detail the progress of the case, except to say that he recovered after three weeks' attendance

upon him at his home. This case has been a lesson to me. I hold that if a case of simple pleurisy goes on to effusion under the care of a practitioner, he should blame himself largely if not entirely for it. The effusion of serum is the second means whereby Nature keeps the inflamed pleural surfaces at rest, if agglutination by lymph has failed: and any one who considers himself a competent practitioner will hold, I think, that he should not let it fail.

In contrast to this case I quote another in which, in spite of misleading appearances, the malady was recognised; and the treatment, in consequence, directed with success:—

On March 10th last, there came to the assistant physician's department at St. Bartholomew's Hospital, where I was acting for the time, R. C—, aged thirty-seven, a labourer of intemperate habits, depressed in appearance, and with the general look of a broken constitution. Twelve months before, he had been in the hospital with pleurisy accompanied by effusion on the right side. His complaint was of pain in the left side under the edge of the ribs; of cough, shortness of breath and loss of voice; very bad appetite, retching and vomiting on rising in the morning. His tongue was flabby, clean at the edges, furred on the dorsum. Bowels very loose. Urine clear, dark, giving much red coloration with nitric acid. Pulse 120, soft, regular. Temperature normal. On the whole he presented the picture of alcoholic dyspepsia. Physical examination showed traces of old pleurisy at the base of the right lung in impaired percussion note, vocal resonance, and thrill. At the base of the left lung I noticed doubtful crepitations and friction-sound. This ailment had come on gradually for five days: he could not assign any cause for it. He had continued at work until the day before. Diagnosis was made of diaphragmatic pleurisy. He was ordered a large mustard poultice to the left side, and a draught containing  $\frac{1}{2}$  gr. of acetate of morphia,  $\frac{1}{2}$  gr. tartar emetic, 60 grs. sulphate of magnesia three times a day. Three days after he returned, much better, the pain, friction-sound, and crepitus gone, complaining only of a little cough and of a distaste for food. He was given the Haustus cinchonæ acidus, and a morphia linctus, and continued to improve rapidly on these until he ceased attendance.

Inconclusive by themselves, these two cases are selected from a series out of which I have been able to draw some few conclusions. Had I to treat the first of these cases over again, I should employ the treatment which I employed with the second, feeling certain that I should have met with equal success.

Of local applications I have come to rely on two only : a mustard plaster, not less than four inches square, kept on as long as the patient can bear it : and a mild vesication to the same extent with acetum cantharidis, or linimentum sinapis compositum, painted on, if necessary, more than once. Stronger vesication makes a sore long in healing, and is more than is necessary for the cure.

Before, and for some time after, I used tartar emetic I was in the habit of prescribing the hospital mixtures containing acetate of ammonia with camphor water, sulphate of magnesia, or vinegar of squill respectively, adding morphia when required, in a manner which may be condemned as routine, but which is, at a large hospital, found to be unavoidable. The effect of these I found uncertain ; the patients as often returning worse as better. I can hardly convey an idea of the confidence with which I permit myself to treat these cases since my adoption of Dr. Billing's mixture. The quantity of antimony employed should not produce any purgative, emetic, or sudorific effects ; if it does it should be diminished, or entirely stopped. Its action is to be appreciated by comparison with the use of other drugs. The alleviation of the pain is not due solely to the morphia, nor to the counter-irritant employed. For it appears in cases where neither has been used ; and I myself put it down to a restoration of circulation in the inflamed parts, similar to what I have seen produced in more than one case of erysipelas attendant on varicose veins in the leg, where the same remedy was employed.

Antimony appears to be a tonic to several nerve centres in the medulla (a point to which I shall again refer), among them to the vaso-motor : an action which is reversed by poisonous doses. That it has also a local action on the blood-vessels I think highly probable, but am unable to define in terms of physiology what that action is. My belief in the existence of

such a property, however, led me to try the drug in a case of pleurisy with effusion, in the hope of favouring absorption; after the manner in which mercury used to be prescribed. The result was successful: how far it was due to the treatment cannot with certainty be pronounced:—

H. C., aged fourteen, walked to Mortlake from Paddington to see the Oxford and Cambridge boat-race; and, arrived there, while heated sat down upon the grass. On the way home he felt chilly and giddy and sick; the same evening he had rigors, and a cough appeared. On April 2nd he was brought to me at the Western General Dispensary, and was found to have an effusion in the right pleural cavity to the level of the nipple. His heart was displaced one inch to the left. The temperature was  $102^{\circ}4$ . The pulse beat 130 to the minute. I ordered mustard poultices to the right side, and a draught containing 15 ms. of antimonial wine, that is  $\frac{1}{16}$  gr. of tartar emetic, and 60 grs. of sulphate of magnesia in an ounce of spearmint water three times a day. He was also to take a teaspoonful of the dispensary linctus when the cough was troublesome: to have low diet, and to stay in bed. On April 4th I visited him at his home. I found him much easier, the cough much less, the temperature  $101^{\circ}$ ; the bowels were inclined to be loose. Absence of appetite was the chief thing complained of. This I have noticed in nearly every case, in which I have given antimony for a day or so. It is not, by the patients' description, nausea, nor the anorexia of fever, but "a feeling of not being ready for the meal when it arrives." Being a spoilt boy, he had not allowed his mother to keep on the poultices, and I take it that they produced little effect, seeing that they had not reddened the skin. The mixture was continued in half the dose. On the 8th he professed himself quite well. His heart had receded to its normal situation. The area of dulness to percussion had diminished by one inch. Vocal vibration was restored nearly equal to that of the healthy side. Moist *râles* were heard over the base of the right lung. He had refused to stay in bed, and had made himself sick with raw apples: the consequent stomach-ache was his sole complaint. I will not detail the further progress of the case; his recovery was complete and rapid. Ten days afterwards there remained

of the effusion no sign but a flatness of the percussion note, and rhonchi with an occasional creaking friction-sound over the affected area. He continued on the same medicine throughout.

Now, though an advocate for the removal by aspiration of pleural effusions, whenever practicable, I find that it is often not possible to persuade those who are treated at their own homes to submit to the operation : and in such cases, any drug which is reputed to promote absorption should receive a trial. The impression left on my mind by this case is that the antimony did act, as mercury is reputed to act, as an absorbent: and at my next opportunity I will certainly repeat the trial.

Whilst following the practice of the Paris hospitals, I several times witnessed good results from a practice of M. Jaccoud's at the Hôpital de la Pitié. In cases of serous inflammation complicating rheumatic fever, where he apprehends effusion, he prescribes 30 centigrammes of tartar emetic in 130 grammes of julep; a tablespoonful to be taken every hour, until the whole has been taken. This produces vomiting and diarrhoea, which cease towards evening. Then the patient receives 3 grammes (I may misstate this quantity) of extract of cinchona in a cordial. In one case, the subject of a clinical lecture, as the result of this treatment, an effusion had disappeared by the next day. On the day after, it reappeared, and the evening temperature rose to 39°4 centigrade. The treatment was repeated with a dose of only 20 centigrammes of tartar emetic, with relief. And it was finally necessary in this case to repeat the treatment four successive times, always with a day's interval between each. This is M. Jaccoud's rule: not to trust the benefit obtained on the first day, unless the following morning and evening temperatures be normal. If not, the prescription is repeated on the third day with a diminished dose of tartar emetic; and when the symptoms are subdued, the previous treatment of the joint affection is resumed.

Of thirteen cases of acute rheumatism, complicated with effusions into the cavities of the chest or meninges, and treated with salicylate of soda, in the course of the year 1877, three died. In 1882, of twenty-three cases similarly complicated, treated as is above described, he lost one. A decidedly good

result. It is generally supposed in England that the treatment, of medical cases at least, in France is nihilistic and inefficient; but in dangerous crises, it is as energetic, or more so, than our own, and, on the whole, justified by the result. I left Paris with more faith in antiphlogistic remedies than I possessed when I went there. It is the general custom in England to leave effusion into the serous cavities, complicating rheumatic fever, alone; some few use blisters or abstraction of blood; aspiration is generally avoided, I believe: therefore I think that this practice of M. Jaccoud's should be recorded in the list of remedies.

Though vomiting and purging take the principal part in this treatment, an impression, doubtless, also is made on the system by the antimony absorbed, by which the course of the disease is permanently modified; a modification which would not be effected by any simply vomito-purgative drug. I cannot render my meaning more plain than by relating the following case:—

On February 16th last I was asked, by the gentleman who was at the time acting as house surgeon to the Western General Dispensary, to see J. W—, a carman, aged thirty-three, an old patient, but who for his present illness had been under treatment for four days only, and was progressing badly. Going to the house at once, I found him in bed, propped up with pillows, gasping for breath, his lips swollen and purple, his tongue the same, so large that he could hardly protrude it, and covered with flakes of yellow fur; his face ghastly, dusky, and puffy; his eyes glistening and congested. The pulse beat 100 in the minute, large, heaving, regular. The respirations were 40 in the minute. All over the chest were loud, moist rhonchi. The percussion note was good throughout. The pulse of tricuspid regurgitation showed in the jugular veins. I never, even afterwards, completely satisfied myself as to the lesions in his heart: mitral and tricuspid regurgitation there certainly were; whether there was aortic too I could not decide. All that I made out at the time was that the apex beat one inch outside the nipple line, and a strong pulsation in the epigastrium. The action of the heart was forcible, tumultuous; both sounds prolonged and indistinct, without diastolic pause. His legs and

his hands were œdematos and cold. For some nights he had not slept for fear of suffocation. He complained greatly of wishing to be sick, wanting solid food (which had been forbidden), as it eased the sensations in his stomach, and refusing slops. Poultices (which had been ordered) suffocated him, he said : and, if the case had not been so serious, it would have been laughable to see, what I saw on my entrance, the nurse holding a large jacket poultice and his wife a basin of broth, beseeching him to be reasonable and to take what was ordered. That the man was likely to die in a few hours of cardiac dyspnoea, unless promptly relieved, was very plain. He had been taking, from the first, a mixture containing 5 grs. of ammonium carbonate, 8 ms. of tincture of digitalis, sulphuric æther fʒss., infusion of senega fʒi., every three hours : 60 grains of compound jalap powder had been ordered on the 12th, without producing any effect : also brandy four ounces a day. This stimulating treatment had, apparently, increased the congestion. I thought venesection indicated, but difficulties were in the way. I therefore decided on an emetic, having read of its utility in similar cases (at page 428 of the sixth edition of Dr. Billing's *Principles of Medicine* is a note which is well illustrated by the present case). From fear of overdoing it, I prescribed what proved barely sufficient. For I ordered antimonial wine fʒss., ipecacuanha wine fʒii. in sufficient water, to be taken at once, and when it should have acted a draught of spirit of ether and aromatic spirits of ammonia, of each fʒss., in water, if he should faint ; and for food, toast and a brandy-and-egg mixture. And then I took my leave, telling the friends that I had very little hopes of his recovery. Next morning I called, fearing to find him dead. What was my comfort to see him propped up on his pillows, sound asleep, sweating copiously ; and I learned that the emetic had been taken about noon, but had not produced vomiting ; only two fluid motions. In accordance with my instructions they had waited for the vomiting before giving him any food or medicine, so that he had been until the evening without taking any. Then he had taken of both and fell asleep, and slept for several hours. I woke him up by listening to his chest. He professed himself much better. The feeling of nausea was gone, and he asked for a

chop for dinner. The tongue in particular had shrunk to half the size that it was on the previous day. The chest signs were unchanged, and the dropsy not diminished. He was ordered a hot bottle to the feet, the foot of the bed to be raised, to continue the ether draught, and to have the chop for dinner. On the next day but one, the 19th, I found that he must needs get up to sit near the open window for fresh air (fortunately the weather was mild and fine), professing himself comfortable. He ultimately recovered, and went back to work.

Now here was a case in which a very small quantity of tartar emetic,  $\frac{1}{8}$  gr., aided by the equivalent of 6 grs. of ipecacuanha, which may be taken as another  $\frac{1}{8}$  gr. of tartar emetic, sufficed to produce a radical alteration in a malady. The symptoms pointed to his stomach being congested, full of mucus and saliva, and distended with flatus, by which digestion was prevented and respiration impeded, and the rest of the alimentary canal, no doubt, was in a similar condition. Partial though the action of the remedy was, it cleared the bowels; no doubt it depleted the blood of a certain quantity of serum, and so prevented further exudation into the bronchi. But it did more: it gave the patient several hours' sleep, and a feeling of comfort and safety which he had not had. This means, that his system had been enabled to accommodate itself to his impaired circulation and haematoses until time had been gained to improve them. And the satisfactory condition of his digestion on the following day shows that the mucous membrane of his alimentary canal had nearly resumed its natural state. Stimulating drugs, and a considerable quantity of alcohol and liquids were simply embarrassing this man's malady; and I have no doubt now, looking back at the case, that venesection also would have fulfilled some of the indications of this case; though not, I think, everything that was performed by the tartar emetic practically unaided.

Ipecacuanha resembles antimony in nearly every respect. We are recommended it in preference to the latter, when we require a milder action. This milder action, I believe, is due to a deficiency of emetin in the specimen used, and, when the powder is administered in bulk, to the necessity of its extraction by the gastric juice. The experiments of Dr. Duckworth with

emetin related in vol. v. of the *St. Bartholomew's Hospital Reports* show that its toxic action is powerful, and very similar to that of antimony. As long as the high price of emetin excludes it from general use, it is very desirable that the galenical preparations should be standardised before sale. The use of ipecacuanha in powder as an emetic is wasteful, and when the stomach, as in the case of J. W——, is not in a condition to secrete, its action is tardy or wanting. From these defects tartar emetic is free, and a judicious alteration in the amounts of the doses prescribed by the Pharmacopœia would reveal merits now denied to it.

Its purgative effect is an additional advantage, and one that is often overlooked in its use.

Before passing from tartar emetic I would draw attention to the benefit which medical men may derive from a study of veterinary practice. Veterinary therapeutics is simply a vast field of pathological experiment untrammeled by Vivisection Acts, and the use of antimony as a tonic, familiar to every groom, is worthy of our best attention. Its effects, thus used, are exactly those of arsenic, as currently related, upon the Styrian arsenic eaters; improvement of the wind, of the circulation, of the functions of the skin, increase in weight, and plumpness of the muscles: the latter being probably the result of diminished tissue change.

Many preparations, all formed by oxidation of the sulphide of antimony, such as the kermes, the glass of antimony, and the golden sulphide, have been official: as also various antimonites and antimoniates. All of these may be found described in Hooper's *Medical Dictionary* and similar works. Uncertain by their composition, and by their modes of preparation, they have fallen into disuse. They depend for solution in the acid of the stomach for absorption; whence, as was well known, violent irritant effects often followed their introduction when accompanied by acid medicines or solid food. The oxide of antimony, which seems to be the active part of all, has superseded them. To this James's powder owes its efficacy, but is reputed, and as far as my experience goes, justly, far superior to the pulvis antimonialis of the Pharmacopœia, which is a simple mixture of the oxide with phosphate of lime. This is, I think, due to the

physical condition of the ingredients of the proprietary powder being more apt to excite the flow of solvent fluid, taken as the powder usually is, at bedtime, on an empty stomach.

For the production of diaphoresis this slow absorption of a considerable quantity of antimony is better than a single minute dose of tartar emetic more quickly absorbed. The same object is attained by administering Dover's powder in a solid form, instead of presenting the active ingredients to the stomach in solution. Troussseau and Pidoux (*Traité de Thérapeutique et de Matière Médicale*, vol. ii., page 1113) point out that the sedative effects of antimony are greatly aided by low diet, and that with full diet its irritant qualities appear. Depletion aids similarly, so that the most favourable results in sedation are to be observed in those on whom depletion can be most safely practised, namely, male adults. Troussseau believed strongly in alteration of the constitutions of diseases, and I will refer to the article quoted for some interesting notes of the consequent alterations which he found necessary in his prescriptions of antimonials.

I owe, to witnessing the practice of my colleague, Dr. Stocker, at the Western General Dispensary, my first use of the pulvis antimonialis and the James's powder; both of which have been to me the means, alone or combined with other drugs, of conferring many a good night's rest.

Antimony is not an anodyne and is, therefore, useless against pain. Nor do I anticipate much benefit from it in delirium, from the slightness of its action on the cerebrum; though I am not unmindful of Graves's combination of it with opium for his fever cases. But it possesses a tonic action on the medulla similar to that of zinc, of phosphorus, of atropine, and of picrotoxine; by which it is indicated in cases where wakefulness is due to exhaustion, alone or as an adjunct to alcohol and opium. The sudorific action for which this preparation is noted depends, I think, on the stimulation, mainly of the sweat centres in the medulla, but also, without doubt, of the sweat glands and their distributed nerves. In harmony with this idea is the fact, which I have often noticed, that antimonial powder checks the night sweats of phthisis; which is also a property of Dover's powder and of alcohol. By Dr. Brunton these sweats have been shown to be most probably due to exhaustion of the respiratory centre

by coughing, aided by a reduction in the area of functional tissue in the lungs ; by which carbonic acid is permitted to accumulate in the blood, and to produce that sweating which is one of its poisonous symptoms. Thus it is that very diverse drugs, all of which possess the power of raising the tone of the nerve centres, may have a common use. I cannot do better than quote an illustrative case :—

There came to see me at the Western General Dispensary on August 30th last, Eliza H——, unmarried, aged twenty-nine, a shirt-maker : born in London. All her brothers and sisters died in infancy. She has long been subject to cough, and now complains that it is worse, with much yellow phlegm. She has lost her voice, and has night sweats. Examination showed her chest to be barrel-shaped, with a very limited range of expansion ; “breathes with her diaphragm,” says my note. The respiratory sounds were very feeble at the apex of the right lung, and the expiratory sound was morbidly prolonged ; moist crepitus extended from the apex to the nipple. The heart’s action was rapid and feeble. She was ordered a draught containing 1 gr. of sulphate of iron, 10 grs. of sulphate of magnesia, 5 ms. of dilute sulphuric acid, three times a day ; at bedtime, a powder of three grains of liquorice with one of pulvis antimonialis. Seen September 6th for me by Dr. Stocker, who noted “much better,” and repeated powder and mixture. On the 10th I saw her myself, and noted “much better : no night sweats now : very little cough : complains of bad appetite ;” that is, the curious absence of the proper sensation at meal times, which I have above noticed. I therefore discontinued the antimonial powder, and repeated the draught with 2 grs. of sulphate of iron, and 2 grs. of sulphate of quinine. She did not come again.

A drug which is a most suitable adjuvant to antimony, where cough is present, is conium. It has been under a cloud since Dr. Harley’s examination of its properties, and passes for one of the most inert articles in the Pharmacopœia. Doubtless, its effects are variable, since they are due to a very volatile alkaloid ; this, however, is a reason not for abandoning the use of the drug, but for rendering its composition more uniform. The action of conium on sensation resembles that of curare and of camphor ; it paralyses nerve endings, both motor and sensory. Now it is

plain that a drug which heightens the action of the respiratory centre will probably renew the cough, which had exhausted that centre; to it we may therefore very conveniently add one which will numb to the required degree the nerves that are distributed to the point of irritation. Opium and alcohol both have this anaesthetic property; atropine and hyoscyamine to a much less extent. All, no doubt, have seen cases of phthisis in which atropia has arrested the sweats, without conferring relief from cough; or has even increased it. I take this to be the physiological explanation of the favourite combination of camphor with hyoscyamus. As a tranquillising remedy in various affections, I have certainly witnessed excellent results from the addition of 4 or 5 grs. of extract of conium to antimonial or James's powder.

In this paper I have not sought to advance new theories so much as to draw attention to the present neglect of a remedy which has held a place in therapeutics for a very long time, and which has enjoyed the favour of the greatest physicians. What was sanctioned by Sydenham, by Huxham, and by Troussseau, must be possessed of qualities which should challenge our attention. Like my knowledge, these notes are not exhaustive; I hope hereafter to extend both.

## ACUTE PURULENT CONVERSION OF THE LUNG.

BY THOS. J. RAVEN, F.R.C.P., &c.

I HAVE thus designated the case which I am going to give an account of because, as will be seen, the clinical and the pathological features were such as to make me doubt whether I was dealing with a disease that could properly be called acute pneumonia. As to whether I am describing a rare type of pneumonia, or really a different disease, is a question which I do not pretend to decide; and I shall content myself with stating facts as they appeared, and with making a few references to authorities. I am not acquainted with any recorded instances of the kind (although I have searched for such) where the details have been traced from the outset to the autopsy.<sup>1</sup>

E. M., aged fifty-nine, a cachectic-looking man, who a few years previously had nearly died of carbuncle, and who latterly had shown signs of failing strength, had an attack of shivering on April 4th, followed by pyrexia, and pain in the left side. There was no headache then or subsequently. I saw him on April 6th, the third day of the disease. His general condition was one of considerable debility, but the mind was clear and collected. He complained of pain in the left side, especially when he breathed deeply or moved. His pulse was 114,

<sup>1</sup> We have seen several cases resembling those described in this paper, in symptoms and in physical signs, but have not obtained an autopsy in any of them. Their occurrence appeared to us to be connected with sewage poisoning, the drainage in the houses where they occurred being defective. In one instance a gentleman and his sister-in-law, living in the same house, were both seized with a rigor on the same night. The gentleman died in sixty hours. The lady died with symptoms and signs like those here described in six and a-half days. The use of Warburg's tincture in large doses (*Practitioner*, Feb. 1877, vol. xviii. p. 81), seemed to have a good stimulant action, but it was only temporary.—ED. *Pract.*

respirations 32, temperature  $101^{\circ}4$ . The skin was dry and harsh. The urine was scanty and concentrated and non-albuminous. There was scarcely any cough and no expectoration. At the left base the percussion note was dull, the breath sounds were obscured, and a loud and extensive pleuritic friction-sound was audible. Higher up the respiratory murmur was natural, and nowhere could bronchial breathing be heard, or any moist sounds. Vocal *fremitus* was deficient, comparatively with the right side.

On the following day my notes were:—Pulse, 114; respirations, 18; temperature,  $102\frac{1}{2}$ . Is sleepless, coughs up some white viscid mucus. There is a very loud and widely-heard friction-sound over the left base, but no physical evidence of pneumonia.

On the 8th of April he was much the same, but weaker, my note as to physical signs was:—dull percussion and deficient respiratory murmur and absence of vocal *fremitus* extending higher from the left base. The friction-sound is subsiding.

These evidences gradually increased and the man became more prostrate. By the 11th of April, that is the eighth day of the disease, the respirations had reached 44, the pulse, 130, and the temperature  $103^{\circ}$ , and he was in a seriously exhausted condition. Dull percussion now extended over three-fourths of the lower left chest. The friction-sound had vanished, and still no trace of tubular breathing was found. Vocal vibration was absent and no respiratory murmur could be detected. As the physical signs indicated pleurisy rather than pneumonia (although the general condition of the patient could hardly be accounted for by pleurisy alone) I decided to puncture the chest and to attempt the withdrawal of possible pleuritic fluid. But nothing could be extracted except a little blood. The man gradually sank and died on April 12th, the 9th day of the disease, dating from rigor.

Treatment was of a restorative and stimulating character from the first; and opium, morphia and chloral hydrate were given to obtain sleep and to relieve pain.

Not only the misleading physical signs, but several observations during the course of the illness made me doubt whether I was treating true pneumonia. The case seemed to differ from

pneumonia in these particulars. 1st. The disease appeared to begin with a morbid change in the pleura, analogous to that found in the lung. 2nd. Prostration of strength was marked from the very beginning. 3rd. There was no headache or delirium throughout. The mind remained calm and unclouded in a degree I have never witnessed in severe pneumonia. 4th. The temperature chart showed that instead of the highest range being reached early in the course of the complaint (as is usual in acute pneumonia), on the third day the temperature was below 102°, and that it gradually rose afterwards.

The falling of the rate of respiration, from thirty-two on the third day to eighteen on the fourth, was difficult to understand and difficult to reconcile with increasing lesion of the lung.

At the post-mortem examination the left pleural surfaces were seen to be smeared over with thick creamy masses of recent lymph, and the lung was firmly bound down by old adhesions. The left pleural cavity contained about six ounces of fluid. The left lung was practically destroyed, five-sixths of its substance being involved in pronounced purulent infiltration. The extreme apex above was crepitant. Elsewhere the pulmonary substance was engorged with pus; it broke down under the fingers and sank in water. But nowhere was red hepatisation to be found. The condition of purulent infiltration below merged into mere congestion at the apex, without a trace of the second anatomical stage of pneumonia intervening. The right lung was normal.

These post-mortem appearances fully accounted for the perplexing physical signs noted during life. The lung passing at once into a pulpy, spumous condition, and being directly choked with pus, was no conductor of sound. Hence the breath sounds and the vocal *fremitus* were as conspicuously absent as in pleuritic effusion.

In Hodgkin's *Lectures on the Morbid Anatomy of the Serous and Mucous Membranes*, published nearly half a century ago, the author describes a "pneumonia of the non-plastic form." He says "it is this form of pneumonia which gives rise to the light-coloured consolidation of the substance of the lung which is not produced, as is generally taught, as a later stage of the red induration, but which I am persuaded is of a light colour from

the very commencement." He then proceeds to give reasons for this conclusion, which are, briefly : 1st. That the history of many cases of pneumonia has been too short to admit the probability that red hepatisation had preceded the light-coloured consolidation. 2nd. That there is an essential difference in the form of the lung affected by these two modes of disease. Whereas after red hepatisation there is no alteration of the bulk of the lung, in the primary grey consolidation the texture of the lung appears to be placed in a state of extreme distension. Subsequently he describes the grey hepatisation which is seen as a later stage of red consolidation, and it would appear that he regards the "non-plastic,"<sup>1</sup> light-coloured induration and that which follows "red induration," if not as different diseases, yet as "different modes of disease."

Dr. Sturges, in his well-known work on pneumonia, endorses the view of Hodgkin so far as to admit the probability of primary grey hepatisation, and in his tables of cases he points to three instances which appear to be of this class. The clinical details of these cases are, however, scanty, and they are not introduced with the view of supporting the theory of Hodgkin.

<sup>1</sup> "Non-plastic" seems to be an epithet scarcely strong enough to apply to a disease attended with such rapid demolition of a vital organ.

## ACUTE PLEURO-PNEUMONIA IN A CHILD, TERMINATING IN GANGRENE OF THE RIGHT LUNG.

BY WILLIAM H. DAY, M.D.

*Physician to the Samaritan Hospital for Women and Children.*

CASES of pneumonia which run a rapid course are interesting both in regard to pathology and treatment. Of their pathology we know but little, and the treatment is most unsatisfactory; but we may trust that when we know why the lung breaks down so rapidly as in the following case we may be able to do some good, either in the way of prophylaxis or cure.

A. F., aged ten, was admitted into the Samaritan hospital under my care on July 4, 1885. She was a thin, spare child, and had been delicate from birth. When a year old she had whooping-cough, and at four years of age, measles. For some time before admission she had complained of giddiness and faintness; the week before she had become worse, having fainted three times, and perspired at night. Four days before any assistance was sought the mother stated that the child's breath was offensive and that phlegm was coughed up. The patient walked to see Dr. Amand Routh in the out-department on the day of admission. Her father died of phthisis.

When seen at 2:30 P.M. she complained chiefly of pain across her forehead, which was very hot, and she seemed glad to get into bed and lie down. The temperature was 102·0; pulse 108; respirations 40; face pale, with a sad and listless look. There was a short, dry, and frequent cough; she also complained of pain in her right side, just above the diaphragm and below the nipple. She lay on her back, and was indisposed to move or speak. On a physical examination of the chest, the costal movements were diminished on the right side; the lung was

dull on percussion from the spine of the scapula downwards, imparting a sense of resistance to the finger. Over the centre of the scapula was loud, hollow, bronchial breathing. Just below the angle of the scapula and over the infra-axillary region there was heard a distinct friction-sound of a superficial, creaking and high-pitched musical character. Over the anterior surface of the lung from the collar-bone to the nipple there was resonance, but the respiration was dry and harsh. Just below the nipple there was impaired resonance with small soft rhonchi, and the weight of the stethoscope was complained of. The urine was in all respects normal, clear, acid, and non-albuminous, with a specific gravity of 1016. A large linseed poultice was applied to the whole of the right lung, in front and behind, and ten grains of salicylate of soda and a grain of quinine were given every four hours. On the following day (5th), it was reported that the patient had passed a restless night from harassing cough and great thirst. She had taken strong beef tea, egg with milk, and milk and soda-water freely. She was quite intelligent, and free from headache; the tongue was slightly furred at the back, but moist, and the bowels had acted twice. The breath was very offensive, which neither the state of the teeth, gums, or cheeks accounted for; no night perspirations. The creaking friction-sound was the same. At 8 A.M. the temperature was 99·0, and at 3 P.M. 102·2; pulse 140; respirations 36. Tubular breathing was loud, with a little subcrepitant rhonchus over the lower lobe of the right lung and the inferior portion of the axilla. The room was impregnated with the vapour of carbolic acid. At 8 P.M. the temperature fell to 101·0. On the morning of the 6th, at 8 A.M., the temperature was 100·6; the patient had slept at intervals, and had been sick frequently, but never expectorated or coughed up any kind of secretion. The tubular breathing was louder over the centre of the scapula, with a little subcrepitant rhonchus over the lower lobe of the right lung and the inferior portion of the axilla; the creaking friction-murmur in the right infra-axillary region was still distinct. The cough was not so troublesome or painful. On the 7th it was reported she had had some sleep, and appeared to be better; the temperature at 8 A.M. was 99·0, at 1 P.M. it was 100·0; pulse 120; respirations 40; the breath

was horribly offensive. The right back was not so dull on percussion, and the crepitation was larger, more liquid, and copious ; the urine was still normal, acid, pale straw colour, sp. gr. 1024. On the 8th, at 8 A.M., the temperature was 99·0 ; at 1 P.M. 99·4, pulse 112, respirations 44 ; the cough was loose, and she was pale and more exhausted, although she had taken freely of nourishment, and never once refused it. She complained of piercing pain below the right nipple, to which she repeatedly put her hand ; there was a good deal of flatulence, and the breath was more foetid than it had been hitherto ; tongue more furred. She was ordered a mixture of dilute hydrochloric acid, chlorate of potash and bark. On the 9th, at 8 A.M., it was reported that she had not slept during the night, but had been very quiet ; the skin was moist, the face was very pallid, rather puffed, and the nostrils were active, pulse 132, respirations 56. The odour of the breath was intolerably foetid, and pervaded the atmosphere of the ward, notwithstanding all the precautions that were taken ; the bowels acted twice and the motions were healthy, the urine remained the same ; cough was looser and more frequent. The intercostal spaces were all distinct, below the spine of the right scapula there was loud gurgling rhonchus, a conclusive indication of the lung breaking down. In the inferior portion of the axilla, the creaking, leathery, friction-sound was still heard. In the lower half of the right sternum loud gurgling rhonchi were heard, just as behind ; above this the respiration was tolerably clear, and the percussion note was resonant. In the upper part of the axilla there was moderate resonance, and respiration was heard of a faint character ; below there was absolute dulness and no respiratory murmur. The respiration was abdominal. Pain was complained of over the ensiform cartilage and the lower ribs on the right side, which seemed to indicate the extension of inflammation to the diaphragm. She was exhausted, and very restless and irritable. Since yesterday she had had two tea-spoonfuls of brandy with egg, or milk, every three hours. At 10 P.M. she was more exhausted ; temperature 100·0 ; pulse 136 ; respirations 68 ; inspirations very short. At 1·30 A.M. on the 10th the temperature rose to 101·6, she became dusky about the mouth, and could not lie down from difficulty in breathing and pain at

the back of the neck. She had no delirium or convulsions, and was conscious within a few minutes of her death, which took place from asthenia at 2 A.M..

Autopsy sixteen hours after death. Body pale and thin. Between the fourth and fifth ribs, on the right side, the lung was adherent. When the sternum was raised, a portion of lung, soft, rotten, and of a grey slate colour, was pulled away with it. On cutting into this part of the lung, within the chest, was an abscess containing a dark ditch-coloured fluid, of creamy consistence, and intolerably foetid. This cavity, which was of irregular shape and about the size of a walnut, was surrounded by rotten lung tissue, and had the sternum immediately in front of it. There was another cavity just above it, behind the third rib: it was double the size, of the same irregular shape, and contained similar puriform fluid and exudation matter. Nearly the whole of the right lung, except a small portion of the upper and outer lobe, was softened, and easily broke down under pressure of the finger. It was almost entirely infiltrated with grey, yellowish, purulent fluid, which issued from every portion of the lung where a section was made into it. With the exception of a small portion of the upper and outer right lobe, and the borders, which were dark and mottled, the whole lung was gangrenous, impermeable to air, and sank in water. In the fifth interspace, in the direction of a line drawn vertically from the nipple, was a circular yellow patch on the surface of the lung, the size of a shilling, and, when cut into, offensive and slate coloured pus escaped. The lower third of the right lung was adherent to the costal pleura and the upper portion of the diaphragm. There was no fluid of any kind in the pleural cavity, and no communication with it, but some thickening of the pleura over the diaphragm. The left lung was dark and congested in places, but it floated in water and was everywhere permeable to air. The upper part of the lung and borders had a reddish appearance, as is seen in the engorgement stage of pneumonia. There was no tubercle anywhere, and no enlargement of the bronchial or mesenteric glands. The heart was healthy, and the left ventricle contained a small clot. The liver was large, pale and soft. The kidneys were large, but healthy. Spleen normal.

REMARKS.—The termination of pneumonia in diffuse gangrene of the lung is not common at any age, and is of the rarest occurrence in children. It is the first case of the kind that has come under my observation. The power of resistance in some children is so feeble that in exceptional cases, like the present, a low degree of inflammation may lead to abscess and, still more rarely, to gangrene; but exhaustion and bad hygienic conditions were probably essential factors in the condition. The intensely foetid odour of the breath, with the general and local symptoms, induced me to think that the lung was becoming gangrenous the day after admission into hospital. The physical signs were, first, those of pulmonary consolidation, with implication of the pleura, succeeded by those of excavation and the breaking down of the lung texture. From the time the child was admitted into hospital the progress of the disease was rapid, and the symptoms indicated considerable prostration of the vital powers. Although a limited portion of one lung, or one lobe, may become gangrenous, and cicatrisation ensue, for the entire organ to be involved is most exceptional, and recovery is hopeless under such circumstances. Death on the fourth day after admission indicated the adynamic character of the affection. The disease probably originated in pneumonia of a low type, running on uncontrolled through all its stages, the lung breaking down by softening and disorganisation. A circumscribed abscess resulting from inflammation is extremely rare, but diffuse gangrene is still more so. It would appear to have been more the result of some unhealthy state of the constitution, and a depraved condition of the blood, than of mere inflammation.

In a letter to the *British Medical Journal*,<sup>1</sup> Sir Spencer Wells drew attention to the fact that Dr. Biondi of Naples had performed pneumectomy in fifty-seven cases on animals, of which thirty recovered, and in six, of which the apices of the lung, or only one lobe of a lung, were removed, all recovered. Sir Spencer Wells has therefore pointed out the feasibility of the operation, and the benefit which might follow it in suitable cases, notably gangrene of the lung. The distinct limitation of the disease, in my case, to one lung, and the absence of tubercular deposit, show that the operation might have been followed by

<sup>1</sup> May, 31, 1884.

recovery had the precise nature of the disease been ascertained at an earlier period of its progress. As to the method of performing pneumectomy, Mr. Jennings advises<sup>1</sup>—as the result of operations practised on the dead subject,—that the chest should be opened posteriorly, through a small triangular aperture beneath the scapula, the vertebral costa of which must be exposed by suitable incisions, and the bone with its muscles displaced outwards. Ready access is thus gained to the rest of the lung, and after the removal of that organ, the scapula is replaced, and thus the aperture in the chest is closed. Mr. Jennings states further that the apex of a lung can be removed expeditiously by turning down a triangular flap anteriorly in the infra-clavicular region; the flap consisting of a portion of the second rib, parts of the intercostal structures of the first and second spaces, and of the pectoralis major. After the removal of the portion of the lung, the flap is replaced, and the chest wall restored to its pristine condition.

<sup>1</sup> *Brit. Med. Journ.* 1885, vol. i. p. 201.

## SHORT NOTES ON THERAPEUTICS.

BY H. MACNAUGHTON JONES, M.D., F.R.C.S.I. AND EDIN.,  
*Examiner in the Royal University of Ireland.*

(Continued from p. 30.)

### OCULAR THERAPEUTICS.

FROM these physiological data we tabulate the pathological conditions in which eserine (physostigmine) is indicated, and in which practical experience warrants a favourable opinion of its employment. In all the following affections I have repeatedly witnessed the advantage of the use either of eserine or pilocarpine:—Obstinate and chronic cases of conjunctival and subconjunctival congestion; phlyctenular and pustular inflammation; episcleritis; vascular corneitis; vesicular corneitis; ulcers of the cornea, specific and marginal, Sæmisch's, perforating, rodent; interstitial corneitis; suppurative corneitis, onyx, and hypopyon; peripheral wounds of the cornea and sclero-corneal junction; recent anterior synechia, and in cases of slight anterior adhesion of old standing, posterior synechia; corneo-iritis (tentatively and temporarily), cyclitis, irido-cyclitis, and choroido-iritis; sympathetic attacks of same; paralytic conditions of the ciliary muscle, ophthalmoplegia interna and externa; myopia, with insufficiency of the recti; primary glaucomatous states, idiopathic and traumatic; hypertension and intra-ocular hypersecretion, retinal haemorrhage, infarction, detachment; subretinal effusion, optic neuritis, and papillitis. If I testify thus pointedly to the value of both eserine and pilocarpine it is simply because I feel that many eyes are lost from the want either of this knowledge, or sufficient appreciation, of the safe-

guard and remedy we have at hand in these drugs in various most dangerous affections of the organ of vision. To ophthalmologists this may be nothing new. But it frequently happens that the critical time has past when an eye is brought under the observation of the oculist. The most important time to secure the therapeutical effects of the drug has slipped by, and it may be that the advantages of these are lost. Nothing has more surprised me than the limitation of the knowledge of the action and uses of these drugs when recommending their employment. The technicalities of special literature may explain this to some extent, but that experience is my excuse for endeavouring to concisely tabulate the pathological indications for the use of mydriatics and myotics, and differentiating those indications. I know of no remedy in ocular therapeutics that yields such striking results as eserine. And if I were asked to cite those cases in which I have been most struck by the results of its application I should say (1) deep or extensive corneal ulcers; (2) suppuration of the corneal cement; (3) corneo-iritis and episcleritis; (4) cyclitis; (5) irido-cyclitis (sympathetic); (6) wounds of the ciliary region; (7) in hypopyon, combined with keratotomy or sclerotomy; (8) after cataract operation, with tendency to entanglement of the iris or corneo-iritis; (9) glaucomatous states; (10) retinal congestion, papillitis, effusion; (11) myopia with and without paralysis of accommodation, and attended by insufficiency of the external muscles. Combined with paracentesis and the use of the compress bandage in cases of perforating corneal ulcer, or applied locally while we accentuate its effects by subcutaneous injection of pilocarpine in primary glaucoma, we have the most perfect examples of its physiological expression in the diminution of tension and the rest which follows. I have already instanced a case exhibiting well its action in retinal congestion and papillitis. Take such a one as the following to exemplify its value in cases threatening acute primary glaucoma.

Mrs. H. consulted me on May 27th for sudden failure of vision of the right eye. Three years previously she complained of the same eye having been affected for a short time with muscae and dimness of vision. This had followed the use of the eye in fine tracing work. On examination I found that she could not

discern features nor could she count fingers with the affected eye at a few feet distance: everything was hazy. With the ophthalmoscope I could hardly distinguish the fundus, and some small particles of hyaloid were visible floating in the vitreous. The tension was considerably increased. Treatment consisted in the administration of iodide of potassium and ergot internally, and the use of a salicylate of eserine, 1 per cent. solution, locally, the eyes being protected from light. On the 2nd of June the vision was considerably improved; she could see features distinctly, count fingers, and could read  $\frac{2}{5}0$  Snellen. The fundus was clear enough for me to examine the optic disc. On June 12th she read  $\frac{2}{5}0$  Snellen easily. On the 1st of July I found the fundus normal, and the vision nearly  $\frac{2}{5}0$ . Referring to the use of eserine in glaucoma some of the conclusions of Dr. Priestly Smith are worthy of notice here.<sup>1</sup>

"It is chiefly," he says, "in very recent subacute or acute attacks that benefit from eserine is to be hoped for." In simple chronic glaucoma contraction of the pupil should be maintained so far as this can be done without causing irritation, in order, if possible, to retard the progress of the disease. He considers a solution of two grains to the ounce sufficiently strong, and in many cases a weaker solution is preferable. The response of the pupil to eserine he regards as an indication for its use. Iridectomy may still relieve when this response has ceased. He regards eserine, both as a preliminary and sequel to sclerotomy, as a *sine quâ non*. Though I have frequently used eserine before iridectomy I have not experienced any special trouble from the haemorrhage said to follow its employment. Dr. Priestly Smith draws attention to the chance of fresh haemorrhage occurring after the use of eserine in recent intra-ocular haemorrhage. In cases of secondary glaucoma, where there are anterior and posterior synechiae, and after operations on the lens, where we dread iritis, eserine is necessarily, as Dr. Smith urges, contraindicated. There can be no doubt that in a certain proportion of cases, in which eserine is indicated, we are forced to abandon its use. There is no amelioration in the symptoms, the eye is not tolerant of its action, it irritates, and patients complain of a sensation of constriction. I have proved that this intolerance

<sup>1</sup> *Ophthalmic Review*, March 1882.

is at times due to impurity in the eserine, decomposition due to prolonged keeping, or the presence of fungi. On changing the solution and obtaining some fresh salt the unpleasant effects ceased. The salicylate is decidedly preferable to the sulphate salt. Again the strength of the solution must be carefully considered. If we weaken the solution to a half or a quarter per cent. the pain and "tightening" sensation of which the patient complains disappear. But when we require a myotic, and that either the eserine fails in doing good or that the eye is intolerant of its use, we should substitute pilocarpine (the salicylate salt being perhaps the best). We gain, I believe, all the advantages of the eserine without the irritating effects of the latter. Frequently in deeper-seated inflammation I have seen pilocarpine succeed where eserine failed. The average strength of the preparation I employ is one to two per cent.

In grouping pilocarpine and physostigmine together as myotics, I should not omit to refer to the difference of opinion which exists as to their respective modes of action on the pupil. I observe that Dr. Lauder Brunton in his recent standard work on pharmacology classes pilocarpine with muscarine and nicotine. He thus ascribes its myositic effect, not to the direct effect of the alkaloid on the muscular fibres of the iris, but to its action on the peripheral oculomotor supply, agreeing with the conclusions of Harnack and Meyer. He attributes the myositic action of eserine to the direct effect exercised on the muscular fibres producing increased action of the sphincter. But we must take into account the probability of a third mode of action of pilocarpine, namely, a paralysing effect on the sympathetic innervating supply of the dilating fibres. The researches of Fitzgerald and Laborde would even apparently point to a primary double paralytic effect. According to them, the action of the drug on the third nerve being more fleeting and less powerful, the oculomotor power over the sphincter is regained and exercised while the paralytic effect on the sympathetic is maintained. Further, when we reflect on the discovery of the second alkaloid jaborine<sup>1</sup> found in jaborandi, the constitution of which differs principally from that of pilocarpine only in the molecular arrangement of the elements, and even the possible

<sup>1</sup> *Vide Bartholow, Materia Medica and Therapeutics*, p. 567.

conversion of the latter into the former under the influence of heat (and possibly other conditions), we have an explanation of some of the apparent contradictory evidence as to the mode of action and therapeutical effects of pilocarpine. For the alkaloid jaborine has a mydriatic influence analogous to atropine, while pilocarpine has the diametrically opposite.<sup>1</sup> Also this curious mingling or possible interchange of opposing forces, should there be any intermediate molecular arrangement when the pilocarpine is held in solution or kept, may help to explain the tranquilising effects of pilocarpine as compared with eserine in certain cases. After considerable use of pilocarpine since the year 1879 in nearly all the deeper-seated diseases of the eye for which eserine is indicated, I can safely say that I have equal faith in it as a myotic and have never seen any injurious effects follow its' substitution. On the contrary, it is my habit, empirical though the practice be, when disappointed in the effect of eserine, to use pilocarpine, and always to prescribe it where I doubt the tolerance of the eye for the former. I have many times verified the statements of Wecker, Gubler, Grandmont, and others, testifying to the value of pilocarpine in various exudative conditions of the retina and choroid. It is my conviction that it is not by any means availed of so largely as it ought to be by the method of subcutaneous injection in deep effusions in the eye, care being as a matter of course taken to exclude any cardiac or pulmonic complication. Also it is obvious from what we know of the constitution of the alkaloid that it is safer to use the freshly prepared solution of pilocarpine, and not one in which molecular change or possible conversion of the alkaloid into jaborine has occurred.

In both alcoholic and tobacco amblyopia, especially in those cases in which there is a partial mydriasis, I have derived much benefit from the employment of pilocarpine locally and the internal administration of santonine and strychnine, though I believe the essential element of treatment to be the total abandonment both of tobacco and alcohol while there is yet time. I have seen patients under this treatment who could barely make their way, and whose vision was reduced to

<sup>1</sup> Perhaps we have in the presence of this analogous principle to atropine the explanation of the use of pilocarpine in night sweating.

discerning cc. Snellen at a few feet, able to return to business and assume the duties of accountant. Strychnine is the nerve tonic on which I place most reliance in those various amblyopic conditions which are the result of purely atonic states of the nervous system, resulting in retinal derangement or muscular innervation and consequent visual disturbance. I find a dose of  $\frac{1}{32}$  to  $\frac{1}{40}$  of a grain (for an adult), (5ii. liquor strychniae in 3xvi. to 5xx. of water) a most effective one, and to this the solution of dialysed iron or of arsenic may be added in certain cases. A curious example of idiosyncrasy occurred in my practice some years since in the administration of strychnine. I ordered for a lad of sixteen, suffering from general atonic symptoms and asthenopia, a mixture ( $\frac{1}{32}$  of a grain dose) of strychnine. After two doses he suffered from violent salivation, and, as described by his mother, an intelligent lady, symptoms closely resembling mercurial toxic effects—sense of fulness of the tongue and general malaise. Frightened, she came to me, and I assured her that it could not possibly result from the medicine; however, I told her not to give the mixture for a few days and then to try half the dose. She did so and almost identical symptoms occurred. I had the remainder of the bottle of fluid sent to me and carefully examined. There was nothing in it save the strychnine which could account for the symptoms. I omitted it and there was no return. It was the only case of the kind I have ever heard of, in which profuse salivation followed the administration of strychnine.

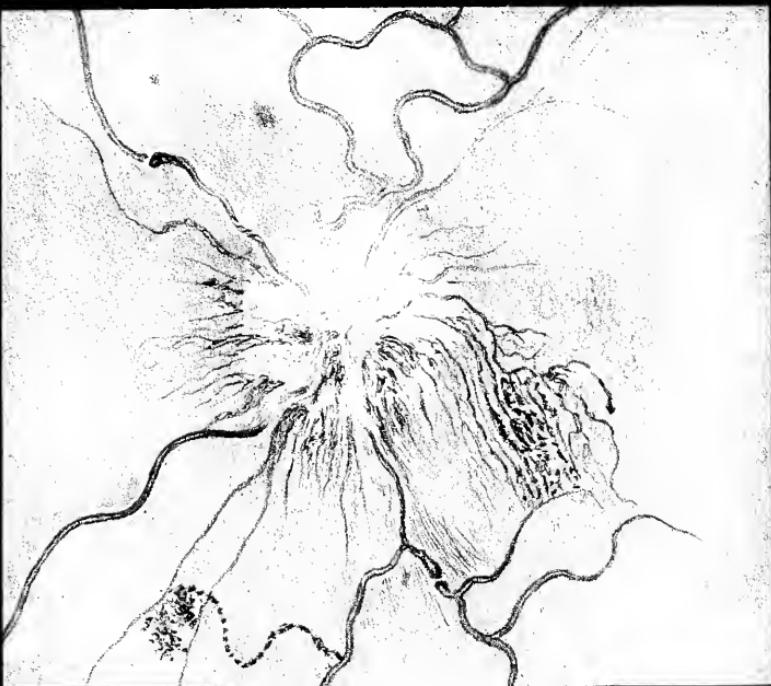
I cannot conclude these brief notes on ocular therapeutics, without, as a word of caution, stating my experience of the number of cases of obscure head symptoms, such as browache, headache, nausea, giddiness, confusion of objects at near work, in which faulty refraction, especially astigmatism, at times attendant upon muscular insufficiency, has been the overlooked cause of the symptoms, when a few minutes' examination (in some optician's shop, if a test dial be not at hand) would have detected the defect and suggested the remedy.

The error I need hardly say is an awkward one. I have recently seen a lady who has been under constant care for two years and a half for persistent headache, who had exhausted remedies and taken refuge in the infallible "change of air"

without deriving any benefit, in whom a short examination revealed both myopia and astigmatism, easily corrected with a suitable cylindrical lens. The precaution to remember the painful symptoms that sometimes accompany spasm of accommodation (especially in young persons) may save many a blunder. A young lady, in March last, consulted me for headache, inability to read, and pain in the eyes on attempting to do so. On examination I found the vision of the right eye reduced to  $\frac{1}{10}$  and the left to  $\frac{1}{4}$  (I purposely use the old notation); convex glasses brought the vision of both eyes to about  $\frac{1}{4}$ ; there was horizontal astigmatism. With the use of a solution of atropine (grs. iv. ad  $\frac{3}{5}$ i.), the eyes being protected by preservers, the vision of both eyes at the end of a month was nearly equal to 1. This restoration remained after the atropine was discontinued. By the use of a + 40 spherical lens, and a + 50 cylindrical, she continued perfectly comfortable, but all her symptoms had disappeared with the action of the mydriatic.

Save that I have already devoted too much space to ocular therapeutics, I should have wished to have made a few remarks on stimulation in the treatment of inflammatory conditions of the eye. I may here, however, record my conviction that, as in the case of the skin, the first object of the practitioner should be to soothe not to irritate. The exceptions are so few that they serve but to establish the rule. I am convinced that incalculable mischief is done by the various stimulating *drops* of nitrate of silver, sulphate of copper, etc., which are indiscriminately ordered in various inflammatory states of the conjunctiva and cornea. I often wish that some of those who order such stimulating applications would try the effect of a nitrate of silver solution (a few grains to the ounce) on the healthy conjunctiva of their own eyes. They might the more fully realise its effects on another's. I do not mean to deprecate the principle of stimulation where such is unquestionably indicated. I have, for example, seen in my old sphere of work, some 500 or more cases of simple granular conjunctiva each year, not including secondary results, amounting in all to about 8,000 to 9,000 cases. My usual treatment, to the success of which I can vouch, consisted in the steady and continued applications of a ten or twenty grain to the ounce solution of nitrate of silver, washed off, when the





Fig



Fig

chloride formed on the conjunctiva, with a weak solution of salt and water, the eye being finally well washed with fresh running water from a small water-tap adjacent. With this plan I never saw a conjunctiva stained. But I only mention this incidentally. The pharmacopœia of the most eminent ophthalmologist is not an extensive one. And with the aid of those few therapeutic means which I advocated in the commencement of these notes, rest, pressure, counter-irritation, cleanliness, heat and cold, secured by some of the simple methods referred to in these papers, I believe useful vision might be preserved to many an eye that otherwise would be lost, and the more quickly lost if those principles of irritation and stimulation which characterised a past age of ophthalmic medicine are adopted.

The case illustrated by the accompanying Plate, Figures I. and II., occurring as I write this paper, is interesting.

Miss C—, aged 34, consulted me on July 3rd for sudden loss of vision in the right eye. For some time she had felt weak and unwell, but had not given up her employment. She first noticed the sight affected on June 29th. She could then barely discern an object. On examination (under cocaine) of the fundus the optic disc presented the appearances shown in Plate I. which was drawn most faithfully by Mr. Burgess on July 4th and 5th. From this latter date until July 9th the eye was placed under the influence of eserine (1 per cent.). As it caused slight pain I then substituted pilocarpine (1 per cent.). She has been taking liquid extract of ergot in  $\frac{5}{i}$  and  $\frac{5}{ss}$ . doses since the first day she consulted me. On July 18th she read  $\frac{2}{v}$  Snellen with the affected eye, and on July 23rd was able to read  $\frac{2}{v}$ . I again examined the fundus under cocaine. It was drawn on the same day. The appearance of the optic disc is shown in Figure II. The sudden loss of vision and the rapid choking of the disc made me suspect either retinal embolism or thrombosis. For this there was no assignable cause. There was no albuminuria, nor has there been. There was no pain in the eye or head. A menstrual period was approaching when the first symptoms occurred. The rapid restitution of vision and the restoration to a condition, almost normal, of the papilla, though not very unusual, are remarkable features. Of course I cannot as yet speak of the permanency of this relief, nor what recurrences or ultimate changes in the neighbourhood of the macula, which appears hitherto to have escaped, may occur.

## ON POISONS FORMED FROM FOOD, AND THEIR RELATION TO BILIOUSNESS AND DIARRHŒA.

BY T. LAUDER BRUNTON, M.D., F.R.S.

“WHAT is one man’s meat is another man’s poison” is a wise saying, embodying the observation of many generations, probably indeed of many centuries. It is only within the last few years that we have begun to discover the true relationship between food and poison, through a number of researches which have been made in the last ten years, and especially in the last five, on the production of poisonous alkaloids from various sorts of food by putrefaction or even by simple digestion. Every now and again we meet with cases of individual idiosyncrasy, in which particular foods produce quite exceptional symptoms. Thus I know a lady in whom a single strawberry causes the face to swell up until the eyes become almost closed. But in addition to these very exceptional cases, we meet with numbers of people—we might almost say classes of people—to whom certain kinds of food are more or less injurious. Milk and eggs are two of the most valuable foods we possess, and in cases of sickness where the patient is unable to take solid food, or in typhoid fever, where farinaceous foods, however easy of digestion, are, sometimes at least, injurious, milk and eggs are invaluable. Yet both milk and eggs appear to be more or less injurious to many healthy persons, and have the evil reputation of being bilious. If we enquire more precisely what is meant by this term we find that these foods are apt, when taken at all freely, to produce sensations of discomfort which are referred partly to the digestive and partly to the nervous system. Sometimes these sensations appear within one or two hours after taking the particular food which disagrees; at other times they may not appear until its

use has been continued for several days. For example, one person, an hour after taking eggs or milk, feels an unpleasant taste in the mouth, general malaise, and a frontal headache. In others, after eggs have been taken for two or three days together, the appetite becomes impaired, the intellect appears less clear, the conjunctivæ slightly yellowish, headache may occur, and the discomfort may culminate in an attack of vomiting or diarrhœa, or both. The vomiting and diarrhœa are sometimes, though not always, preceded by constipation; and both eggs and milk, on account of their constipating quality, are popularly known as "binding."

In some sensitive persons eggs do not merely produce the symptoms of so-called biliousness, but act as violent poisons. A well-marked instance of this kind I have seen in a friend of my own, who was attacked with violent vomiting and purging whenever she happened to take even a very small quantity of egg. So sensitive was she, that on one occasion she was persuaded to eat a small portion of cake by the assurance that it contained no egg. Unfortunately the statement was incorrect, and even the small piece of cake produced the usual symptoms of poisoning by eggs in her. In such a case as this the effect of the food as a poison appears to depend on the individual who takes it. With certain articles of food, which occasionally produce poisonous effects, these effects may be due in some instances to the individual who takes them, but in others to changes in the articles of food themselves. Thus cucumbers and melons are apt to bring on diarrhœa, which may be due in some cases to a peculiar sensitivity of the persons who eat them, but in other cases the disagreeable consequences may ensue from an accidental development of purgative principles in the fruits themselves. There appears to be a tendency to the formation of purgative substances in all plants belonging to the natural order Cucurbitaceæ, of which the cucumber and melon are members. In the colocynth and elaterium plants the purgative properties acquire a high development, and even the cultivated melons and cucumbers appear sometimes to show a tendency to reversion in the same direction, and to acquire purgative properties more or less strong. In the case of animal food we find that poisonous properties are apt to appear either from particular modes of cooking, or from

commencing decomposition. Thus, meat which has been baked in a pie, without a hole in the crust by which to ventilate it, is more apt to disagree than the same meat boiled or roasted. Meat which has been kept until it has become high, or fish which has become tainted, is also very apt to produce symptoms of poisoning.

Till within the last few years we have been very much in the dark regarding the causes of the different phenomena just mentioned, viz : the tendency of milk and eggs to produce biliousness, or to be actually poisonous to certain persons, and of nitrogenous food such as meat, fish, or cheese to act as poisons when putrefaction has commenced, or of farinaceous food such as rye and maize to become poisonous when attacked by fungi. Even yet a great deal remains to be done before the subject is thoroughly cleared up, but so much has been done by recent researches that it may be useful to give their results shortly and to indicate the bearing of these results on the pathology of disease, and more especially on the pathology of biliousness and diarrhoea. The cardinal fact which results from all these researches is that albuminous, or perhaps to speak more correctly proteid, substances which are themselves foods may be split up so as to yield poisons. This decomposition is usually originated by various species of low organisms, and especially of bacilli, but it may be effected by the digestive ferments of the healthy body. The poisons formed by the decomposition of proteid bodies such as albumen, fibrine, and gelatine vary not only according to the particular body which is decomposed but to the particular organism or ferment which sets up decomposition, and according to the temperature at which it occurs and the length of time that it continues. Some of the products of the decomposition of proteid bodies are poisonous, others are innocuous. Amongst the poisonous bodies we find various degrees of activity, some being but slightly poisonous, while others are most virulent. When these poisonous products are separated from each other and isolated, they may remain unaltered and retain their properties for a length of time, but, when mixed together, they are apt to undergo further decomposition and become inert.

In order to make it easier to remember and understand these different changes, I may perhaps be allowed to use a very homely

comparison between the food we eat and the utensils we employ at our meals. Albuminous food will ordinarily do us no harm, although a large quantity of it eaten at once may mechanically produce uncomfortable distension of the stomach. The glass tumbler or earthenware plate that we use in taking our food or drink are also safe to handle, and will do no harm unless they strike with exceptional violence against some part of the body. But this holds good for albumen and for our utensils only while they remain whole, though the nature of the wholeness is different in the two cases, being chemical in that of albumen and mechanical in that of the utensils. When the tumbler or plate is broken across, the sharp edges may render them liable to cut the fingers, but the pieces may be put together with cement and they again become useful as before. When the chemical molecules of which albumen is composed are broken up in the process of digestion into peptones, these molecular fragments become dangerous, and peptones, when injected directly into the jugular vein, act as powerful poisons, producing loss of coagulability of the blood, fall of blood pressure, and death. But in the healthy body the peptones, formed by the digestion of albuminous matters in the digestion, do not enter the general circulation. Like the broken plate they appear to be cemented again into the kind of albumen known as globuline, during their passage through the portal vein and the liver. But it is not when the tumbler is merely broken in half, or albumen simply decomposed into peptones, that the fractured products are most dangerous. It is when the tumbler is broken into splinters that the pieces are most likely to produce serious injury ; it is when albumen has been split up so as to yield organic alkaloids that the products of its decomposition are most poisonous. Amongst the broken glass we may find several pieces which have no sharp points and little, if any, sharp edge, so that they will be almost innocuous, while others may have a point and edge as sharp as a dagger, and capable not only of producing injury but of destroying life, and amongst these sharp pieces we may find some which are much more dangerous than others. In like manner amongst the products of decomposition of albumen we find some which are innocuous and others which are poisonous, and amongst the poisonous we find various degrees of virulence.

If we select from amongst the splinters of glass one with a sharp point and edge and lay it aside by itself, it may retain its dangerous qualities unimpaired for years; but if we leave it to be shaken about amongst the rest, and still more if we continue the very process of striking by which the splinter was at first formed, its point will be broken, its edges blunted, and it will become once more harmless. Similarly the poisonous products of albuminous decomposition when isolated may retain their properties unimpaired, but, if allowed to remain together, and still more if exposed to the continuous action of the putrefactive process by which they were at first formed, they undergo further change and again become innocuous. On this account the products of the decomposition of albuminous matters vary much in their poisonous properties according to the time during which decomposition has gone on. At first they are only slightly poisonous, later on they become intensely poisonous, but at a later stage still their poisonous qualities disappear, and they become more or less innocuous.

It is evident that the splinters of glass will vary according to the kind of glass, mode of striking it, and the force which we employ. If we break a large soda-water tumbler we will get longer, stronger, and more dangerous fragments than if we break a wine-glass, but the force which would splinter the wine-glass might simply crack the tumbler, and that which would split the tumbler into dangerous splinters might crush the wine-glass into harmless fragments. In the same way we find that the nature of the albuminous material influences the nature of the products of putrefaction. When putrefactive bacteria are sown on the flesh of mammals, the substance they produce is an exceedingly active poison, neurine, while they produce when sown upon fish another poison differing chemically from neurine although closely allied to it and resembling it also in physiological action. This poison, muscarine, is very interesting, inasmuch as it had only been obtained from a plant, the *Agaricus muscarius*, or fly-fungus, until it was discovered by Brieger to be a product of the decomposition of fish. Brieger has also found that the typhoid bacillus, when cultivated in peptone, forms no poison, but when cultivated in meat jelly or meat infusion it forms two poisons which he has not yet isolated

completely. One of these causes salivation, diarrhoea and paralysis; the other causes violent and exhausting diarrhoea. The importance of an exact knowledge of the substances which are produced by the decomposition of various foods by the action of typhoid bacilli on them is obvious. The plan of treating typhoid fever by an exclusively milk diet has probably saved many lives, but our use of this plan is to a great extent empirical. We do not fully know why it is successful, and although we may suppose that it is because the milk is non-irritating and does not irritate the intestinal ulcers, that is probably only a part of the truth. For milk may, and sometimes does, form very hard clots, which may pass through a great part of the intestine undigested, and as we see in children may actually be voided in this condition. Farinaceous food on the other hand is chiefly digested by the saliva and pancreatic juice before it reaches the lower part of the small intestine, and even if it did pass over the ulcerated surface ought to do no harm by its mechanical action. Acting on this idea I have sometimes given starchy food in typhoid fever but in a few trials it seemed to cause a rise in temperature, and I therefore abandoned it. If the effect of food in typhoid fever is a purely mechanical one upon the ulcerated intestine, calf's-foot jelly ought to be well tolerated; but if the typhoid bacilli decompose gelatine so as to produce alkaloids having a violent purgative action, the jelly will be very injurious.

The temperature at which the putrefactive processes occur greatly influences the rapidity with which the albuminous substances split up, and the nature of the products which they yield. When the temperature is low decomposition occurs slowly, but does so quickly when it is high. It is probable that it may be much modified by other factors, such as the quantity of moisture in the albuminous substance itself, or in the atmosphere generally; and also by electrical atmospheric conditions, such as those which occur before or during a thunder-storm, for it is an old observation that meat as well as milk often becomes tainted during the electrical conditions which are popularly expressed by the term "thunder in the air." The difference between the products of decomposition in hot and cold weather is illustrated by the alkaloids obtained from

decomposing maize in summer and winter. The alkaloid which it yields in winter has a narcotic and paralysing action; but when it decomposes during summer it yields, in addition to this alkaloid, another one which has a tetanising action somewhat like strychnine. As the putrefactive processes go on more quickly during summer albuminous substances become poisonous much sooner than in winter, and again lose their poisonous properties more quickly by the progress of decomposition. As putrefaction may go on to a certain extent after the introduction of food into the intestinal canal, and will probably from the higher temperature and greater moisture go on even more quickly than outside, it is evident that poisons may be formed from the part eaten, and produce dangerous symptoms, while no poison can be found in the remaining parts of the same food. This is perhaps of special importance in regard to milk when used as a food for infants. Milk may apparently be quite sweet at the time it is given, and yet it may be really "on the turn," as the term is. When swallowed by the infant it may rapidly become sour, and disagree, while a portion of the same milk, especially if kept cool, may appear to continue sweet for some hours afterwards. It is highly probable that not the least advantage possessed by milk drawn directly from the breast, over that given by a bottle, is that the former is free from bacteria with which the latter is apt to be contaminated. Both may appear to be equally sweet when administered to the child, but the organisms present in the baby's bottle will continue their action after the milk has been taken, and render it liable to produce vomiting and purging, which, as we shall presently see, are symptoms of poisoning by putrefactive alkaloids.

The risk of contamination is much greater when a bottle with a long tube is used, for the bacteria readily find a lodgment in it; and it is to be remembered that not only do the bacteria present in the milk at the time it is swallowed continue to decompose it in the stomach, but they continue to multiply, so that if even a few are present in the milk when it is taken they may within a short time multiply greatly, and produce extensive changes in the food if they find conditions favourable to their growth in the intestinal canal.

I have already mentioned that even the primary products of

albuminous decomposition by digestive ferments such as peptones are poisonous. But Brieger has lately shown that pepsine will split up albuminous substances still further, so that by digesting fibrine with artificial gastric juice he has obtained an alkaloid to which he has given the name of peptotoxine.

The bitter taste which appears during the digestion of meat, or of milk artificially, is suggestive of the formation of some alkaloid, but I do not know whether Brieger has ascertained this bitterness to depend on the presence of an alkaloid or not. Of late years the use of digestive ferments, and of artificially-digested foods, has become so common that a study of the products of albuminous decomposition is becoming of extreme practical importance, for it is possible that digestive ferments, like other powerful agents, may be edged tools, and capable of doing harm as well as good.

When we consider how many conditions influence the nature of the products of albuminous decomposition we cannot be astonished to find that very different substances have been obtained by different experimenters. The chemical operations required to isolate the different products are so complicated and laborious that most experimenters have been satisfied with obtaining extractiform bodies, and have not attempted to crystallise them. But without obtaining them in a crystallised form one cannot be sure that they are pure, and the recent investigations of Brieger are therefore of great importance, because he has not only obtained several products of decomposition in a crystalline form, but has subjected them to organic analysis, and thus ascertained their chemical composition. The products of decomposition, or, as returning to the illustration we have already used, what we may term the splinters into which the albuminous molecule breaks up, are partly poisonous and partly innocuous. One fragment, as we may term it, which Brieger has got from flesh, is a substance called neuridine, which is innocuous, another, neurine, which is poisonous. From decomposing fish he has obtained a third substance, muscarine, which is more poisonous still, and two other substances, ethylenediamine, which is also poisonous, and gadinine, which is innocuous.

Besides the substances which Brieger has got from decomposing flesh, fish, and cheese, in which decomposition has

been artificially induced, he has obtained from human corpses a different set of bodies, one of which he calls cadaverine, and the other putrescine, which are feeble poisons, and two others which are produced later and are more powerful poisons, causing paralysis and death.

In addition to the alkaloids obtained by Brieger, a number of poisons have been got by other workers from decomposing articles of food or from dead bodies, and even from portions of healthy animal bodies. Although these may perhaps not have been got in the same state of purity, nor have had their chemical constitution so well defined as Brieger's, they are still of great interest and importance. It is evident that when putrid substances are introduced into the body we must be careful to distinguish between the effects produced by the poisonous products of albuminous decomposition and those of the bacteria themselves, for the bacteria after their introduction may act upon the blood and tissues, and form poisons within the body itself even though none were present in the matter injected. Kerner appears to have been the first to suspect the formation of alkaloids by the decomposition of albumen, and in 1820 he pointed out the resemblance between the symptoms of poisoning by sausages and by atropine. He made experiments upon animals, and appears to have thought at first that an alkaloid was present in the poisonous sausage, but afterwards he forsook the idea and regarded the fatty acids as the poisonous agent.

The researches of Magendie and Gaspard on the effects of decomposing organic substances were important, but rather as affording a starting-point to researches on the effects of low organisms on the animal body than on the effect of chemical poisons produced in the putrefaction.

In 1856 Panum showed that the inflammatory change which occurs in the intestinal mucous membrane of animals poisoned by putrid matter is not due to the microbes contained in it, but to a chemical poison which remained unaltered when its aqueous solution was boiled for a long time. His conclusion that the poison contained in putrid matter was of a chemical nature was confirmed by C. O. Weber, Hemmer, Schweninger, Stich, and Thiersch.

Bergmann and Schmiedeberg isolated a crystalline poison

from decomposing yeast, to which they gave the name of sepsine.

Bence Jones and Dupré found a substance resembling quinine in the liver.

Zuelzer and Sonnenschein obtained both from macerated dead bodies and from putrefied meat infusion small quantities of a crystalline substance which exhibited the reactions of an alkaloid and had a physiological action like atropine, dilating the pupil, paralysing the muscular fibres of the intestine, and increasing the rapidity of the pulse.

Rörsch and Fasbender obtained from dead bodies a substance which had properties like digitaline, but which was not crystalline.

*(To be continued.)*

## Reviews.

*An Introduction to the Study of Disease of the Nervous System.*

By T. GRAINGER STEWART, M.D., F.R.S.E., &c. 8vo, pp. 237.  
Edinburgh: Bell and Bradfute; London: Simpkin Marshall  
and Co., and Hamilton, Adams and Co. 1885.

As its name implies, this work is not an exhaustive treatise on diseases of the nervous system, and those who look for detailed information from it will be disappointed. It is an introduction only, and while it has the disadvantage—inseparable from books of this kind—of being sketchy, it has the advantage of giving the broad outlines of the whole subject. It is not a book to be consulted by those who have made a specialty of the study of nervous diseases. But we think it will be very useful either to students or to practitioners, and indeed to all who have not worked much at the subject of nervous diseases, and wish to obtain a general idea of it. To such persons the study of more complete text-books is often comparatively useless, for they are apt to be swamped in details, and to come away from the perusal of the work with confused ideas from which they obtain no practical benefit. From this work, on the contrary, they will obtain only a general outline, which they may afterwards fill in more completely. The subject is treated of in fourteen lectures, of which the first three are devoted to the anatomy of the nervous system, the second three to the sensory functions, and the next two to the motor functions. Then comes a lecture on the use of electricity in diagnosis, which is followed by three lectures on vaso-motor, secretory and trophic functions, cerebral and mental functions, and language. The last two lectures are devoted to the consideration of points bearing on the pathology of nervous diseases, and to their general treatment. In connexion with the sensory system the author deals first with sensations of pain, girdle-pain, heat or cold, formication, numbness, &c., which are independent of external applications, and then with sensibility to impressions, such as contact, pressure, temperature, &c. The alterations in

special senses are next discussed, and the description of visual phenomena is accompanied by a short account of the ophthalmoscopic appearances in cerebral disease, admirably illustrated by coloured figures from Liebreich's atlas. All the lectures on the functions sensory and motor, vaso-motor, trophic and cerebral, form a commentary upon and illustrations of the method of examining and describing nervous symptoms which the author employs. A sketch of this method is given at the beginning of the work, and it, as well as the book itself, is likely to aid both students and practitioners in their study and treatment of nervous diseases.

*A Text-book of Human Physiology, including Histology and Microscopical Anatomy; with Special Reference to the Requirements of Practical Medicine.* By DR. L. LANDOIS, of Greifswald. Translated from the Fourth German Edition, with additions by WILLIAM STIRLING, M.D., Sc.D., Aberdeen. Vol. II. 8vo, pp. 515-1184, with very numerous illustrations. London : Charles Griffin and Co. 1885.

THE promise of excellence held out by the first volume of this standard text-book [*Practitioner*, xxxiv. 281] is well fulfilled in the second and concluding volume. The great subjects of the urinary secretion, the functions of the skin, of the motor system, and of the nervous system, the senses and development are here dealt with in an admirably clear, terse, and happily-illustrated manner. At every turn the doctrines laid down are illuminated by reference to facts of clinical medicine or pathology. Indeed, Professors Landois and Stirling have done much to establish the ideal method of medical teaching held up recently at Dundee by Dr. Gairdner, in which none of the so-called preliminary sciences shall be brought before the student without continual exemplification and application of their facts in the ward and the out-patient room.

## Clinic of the Month.

**Arsenic in Lupus Erythematosus.**—Mr. Jonathan Hutchinson narrates a case in which a gentleman was completely cured of lupus erythematosus by persistently taking five drops of *Liquor arsenicalis*, three times a day, for two years. In March, 1883, the patient suffered from several patches on the face and scalp. In February, 1885, the lupus was quite well. There were left only thin white scars, without any erythema or thickening at their edges. On the sides of the nose these scars were each as large as a shilling, that on the middle of the nose not so big. On the scalp, which was nearly bald, there were several scars as large as the end of one's thumb. The patient took arsenic regularly for fifteen months; he then had a sharp attack of shingles, and left the medicine off for a little time. No local remedy was applied to the patches on the nose whilst the arsenic was being taken, though a hair-wash had been sometimes used for the head. Mr. Hutchinson considers that the cure was entirely due to the arsenic, and suggests that a more careful administration of this drug should be tried in these cases, which are often only partially cured. (*British Med. Journal*, March 14, 1885.)

**Atrophy of Muscles in Pleurisy.**—When synovitis attacks a joint, the muscles which effect the movements of the articulation are prone to waste in a rather rapid manner. The muscular atrophy cannot reasonably be explained on the ground that the muscles are not used, for the atrophy is one which recalls the wasting of muscle seen in cases of infantile palsy, not only in the rapidity with which it occurs, but also in the behaviour of the affected muscles to electrical examination. The wasting of the muscles of the shoulder and thorax on that side which has been the seat of pleurisy seems to us to belong to the same category of phenomena as the wasting of muscle from joint disease; and although the comparison is a trite one, yet we may remember that serous and synovial membranes are regarded as analogous structures. The subject of muscular atrophy resulting from inflammation of tissues in the neighbour-

hood of the muscles is one deserving of much attention. The most probable explanation is that the abnormal excitations proceeding from the inflamed tissues along the sensory nerves have a direct influence on the motor nerve cells controlling the nutrition of the muscles concerned; the bones may waste as the result of a similar "reflex" influence. A valuable paper on the atrophy of muscles of the thorax and shoulder in pleurisy was contributed to the Société Médicale des Hôpitaux on April 10th (see the *Bulletins et Mémoires de la Société*, &c., April 22nd). The author of the paper, M. Desplats of Lille, contends that the muscular atrophy is rapid and frequent in the subjects of pleurisy, that the atrophy plays an important part in the deformities of the skeleton resulting from pleurisy, and that the atrophy is the indirect cause of tuberculosis of the lungs. He recommends that the atrophy should be prevented from coming on by early surgical treatment of any pleuritic effusion, and that measures should be adopted for arresting or combating the atrophy by the use of general and local stimulants, and more especially by faradisation, respiratory gymnastics, compressed air, and so forth. (*Lancet*, May 9, 1885.)

**The Knee-jerk in Diabetes.**—Professor Rosenstein, of Leyden, gives an account of certain observations which he has made as to the occurrence of the knee-jerk in cases of diabetes. It is a well-known fact that many nervous symptoms may present themselves in the course of such cases, and these have at times been of such a kind as to lead to the belief that tabes dorsalis was present also in addition to the glycosuria. Amongst them the absence of the knee-jerk has been noted. It has been suggested that such absence might be due to toxic causes and, as in the case of alcoholism, might be of limited duration only. Dr. Rosenstein gives the details of several cases under his own observation, and draws the following conclusions from them. In a series of cases of diabetes mellitus the knee-jerk was persistently absent, nor could it be reproduced by means of subcutaneous injections of strychnia as in the case of alcoholism. This absence could not be regarded as of toxic origin, since it bore no relation either to the amount of sugar present in the urine, or to the quantity of acetone, or to the substances giving rise to the ferric chloride reaction. Nor was it dependent upon the state of general nutrition or upon the strength of the patient. In only one instance did the opportunity for *post-mortem* examination present itself, and in that case no evidence of organic disease of the brain or spinal cord was discoverable. As regards the diagnostic or prognostic importance of the condition, a reference is made to a paper recently brought before a French society, by M. Bouchard, in which it was recorded that

of forty-seven cases of diabetes with a normal knee-jerk only two proved fatal, while out of nineteen cases in which it was absent six ended in death. Some connexion is also attempted to be traced by the same author between the absence of the reflex and the susceptibility to diabetic coma. Dr. Rosenstein does not confirm either of these observations. (*Berlincr klinische Wochenschrift*, No 8, 1885). [Practitioner, xxxiv. 132.]

**Cerebral Infantile Paralysis.**—Dr. Strümpell has well described this somewhat neglected disease in an article of which the following is a condensed abstract. *Poliencyphalitis acuta* occurs usually before the end of the first year, sometimes indeed in the first weeks of life. It begins acutely without any apparent cause, with fever, vomiting, general convulsions, and unconsciousness. These symptoms disappear as quickly as they began, leaving behind them, as a rule, complete paralysis of one-half of the body, which soon, however, in part disappears. The arm and leg usually remain more or less paralysed, while the facial muscles are restored, though sometimes there is slight strabismus. In other cases the paralysis is a monoplegia, or a sort of ataxia alone is perceptible. There is never any degenerative atrophy of the muscles, though the growth of the affected limb is retarded. The paralysed limbs are slightly contracted, and there is an exaggerated tendon reflex. Most of the patients suffer from subsequent epileptic attacks, which may be general or affecting only the paralysed side. Athetosis is a very frequent accompaniment. In right-sided paralysis the speech is not infrequently affected, and the patients are usually imbecile, though the intelligence may not be weakened. Sensation is unimpaired. The seat of the disease is in the gray cortical substance in the motor region, where in older cases parencephalic lesions are always found. No autopsies have yet been made in the acute stage of the affection. The author remarks on the resemblance to spinal infantile paralysis, and believes that the two affections may be due to the same or similar etiological factors. (*Centralblatt für klinische Medicin*, January 31, 1885.)

**Determination of the Period of Pregnancy by Measurement.**—Professor Ahlfeld, of Giessen, has published tables of exact measurements of the uterus in its different dimensions, made with the view of determining the size of the child and the period of pregnancy. Professor Zweifel of Erlangen has recently published a work on operative midwifery in which he expresses his opinion that minute measurements such as those recommended by Ahlfeld are not more trustworthy than the rough way of measuring by fingers' breadths the distance of the fundus of the uterus from the umbilicus or

ensiform cartilage, which has been in use for generations. This statement Ahlfeld, in a review of Zweifel's book, characterised as erroneous. In the paper before us, Zweifel proceeds to justify his view. Before speaking of his own observations, he refers to an inaugural dissertation on the subject published in 1880, by H. Kreuzmann, one of his pupils, which he thinks demonstrates that measurements such as Ahlfeld's are untrustworthy. Not content, however, to base his conclusion simply on the work of another, Zweifel has made a number of minutely exact measurements, at different periods of pregnancy, of the circumference of the belly, the distance from pubic symphysis to umbilicus, to ensiform cartilage, and to the fundus uteri. He has made sure that the period of pregnancy was correctly stated by including only women who were delivered of full-term children, and reckoning back from the date of delivery. In other tables he has given the measurements of cases grouped according to the size and weight of the child. He shows that although, taking averages, different periods of pregnancy and different sized children show different measurements, yet that these averages are so widely departed from in individual instances that such minute measurements are not to be trusted, and for practical purposes are not worth the trouble of making. In this we think most practical accoucheurs, who know how much the size of the pregnant uterus and abdomen differs in different women, will be inclined to accept Professor Zweifel's conclusions, and rest satisfied with the old mode of measurement. (*Archiv für Gynäkologie*, xxii. 3.)

**Paralysis of the Bladder from the Use of Carbolic Acid.**—Cartaz, in the *Gazette méd. de Paris*, 1884, No. 42, reports interesting cases of vesical paralysis due to the use of carbolic acid in surgical dressings. This is one of the various toxic effects of the acid, and has been observed by the writer only twice, occurring in the first instance after irrigation of the uterus with a two per cent. solution of carbolic acid after abortion. The paralysis disappeared on the substitution of corrosive sublimate as a disinfectant. The second instance was met with in the case of an aged woman with fracture of the neck of the femur. The dressings, which were daily changed, were treated with a five per cent. solution of carbolic acid. In two weeks there was enormous distension of the bladder, and for forty-eight hours the woman had not urinated. By the catheter about a quart of dark-brown urine was evacuated. In four days the paralysis disappeared, the carbolic solution having been replaced by boracic ointment. There appeared no reason to doubt that in each case the paralysis of the bladder was caused by the drug in question, as in both patients the urine had the

colour characteristic of carbolic acid poisoning, and the symptoms of paralysis in each case disappeared on abandoning the use of the drug. Only two similar cases are reported, and in these vesical paralysis resulted from drinking a concentrated solution of the acid. (*Centralbl. für Chirurgie*, March 28, 1885.)

**Salicylic Acid and Castor Oil in Psoriasis.**—Dr. Fox of New York showed at a meeting of the New York Dermatological Society a girl eight years old who had psoriasis covering all the body. The patient's father and sister also had psoriasis. When she was admitted to the hospital, a two per cent. solution of salicylic acid in castor oil was applied to the right arm, a weak solution being used because of the great congestion of the skin. When the patient was shown the scaling was less, and many of the patches had disappeared, although the disease was extending in other directions. To the left arm the mixture of oxide of zinc and balsam of Peru had been applied, and there was even less congestion in this situation. In the second case, the lower extremities were chiefly affected. This patient was peculiarly susceptible to the action of ammoniated mercurial ointment, even a very small quantity exciting severe dermatitis. Chrysarobin pigment had been applied to the right leg, and a five per cent. solution of salicylic acid to the left leg, producing a marked improvement in the condition of the eruption in the latter situation. (*Journal of Cutaneous and Venereal Diseases*, vol. iii. No. 5.)

**Trophic Lesions of the Skin following Cerebral Hemorrhage.**—Dr. Robinson exhibited at a meeting of the New York Dermatological Society the following remarkable case: Rosanna N., aged 33 years, married. Has two children, the older seven years, the younger four, both living and healthy. She has had no miscarriages. Never had any eruption on the body previous to an attack of paralysis. Had paralysis of the left arm and leg, the eyes were turned cross-ways, no paralysis of the muscles of the face. She was more or less insensible for two days. The eruption appeared two days afterwards like a "cold" eruption, with spots on the left ala of the nose, front of the ear, temple, and on the scalp, all being situated on the left side of the median line; no eruption on the right side of the face. At the present time (July 14, 1884), the left ala of the nose is almost destroyed, at the apex it has not extended quite to the median line. The base of the wound is red, non-ulcerating, easily bleeding, the margin is not elevated or indurated, there is no surrounding inflamed areola and no tubercles or cicatrices. On the side of the face, directly in front of the ear, are two pea-sized spots of similar character, but there is only slight loss of tissue. On the scalp there are six

isolated spots, pea to bean sized, with the same characters. All these spots are on the left side, and the eruption extends exactly to the median line. A few cicatrices, the result of previous necrosed spots, are to be observed in the same regions. The age of an individual lesion varies. All appear suddenly and present the character of an acute serous inflammation with rapid destruction of tissue. (*Journal of Cutaneous and Venereal Diseases*, Vol. iii. No. 2.)

**Tinea Versicolor of the Face.**—Dr. Biart, of Omaha, Nebraska, remarks that: "considering the extreme rarity of the occurrence of tinea versicolor about the face, the following case may not prove uninteresting. Ed. C., aged 31, driver, is a very robust man. He consulted me on July 6, 1884, for a brown discoloration on his face. According to his statement, it was spreading rapidly, and he applied for relief merely on account of the resulting disfigurement, as it caused him no other annoyance. He also stated that a similar condition had been on his body for several years. Scales scraped from the diseased surface on the trunk, and from the patch on the forehead, showed the fungus in abundance." (*Journal of Cutaneous and Venereal Diseases*, No. 3, vol. iii.)

**Hydroa, Impetigo Herpetiformis, and Dermatitis Herpetiformis.**—Dr. Robinson of New York classifies under one general head, for which he suggests that the use of the term hydroa might be retained, the papular, vesicular, pustular and bullous forms of eruption which have been described under the terms impetigo herpetiformis, dermatitis herpetiformis, pemphigus hystericus and herpes gestationis. Dr. Robinson gives the following description of a typical case. The eruption commences as papules, vesicles, or bullæ, and forms irregularly shaped patches, pin-head-sized to two inches or more in diameter. The pin-head-sized spots are red, elevated, inflammatory papules, which contain a little serum in their apex. The large patches consist of vesicles or bullæ, intact or ruptured, arranged in groups or rings and seated upon an inflamed and infiltrated base, or the patch has a more or less clear centre. The collection of serum in the apex of the papules soon increases in quantity, and the papule becomes a well marked vesicle seated upon a hardened inflamed base. The vesicle soon becomes flatter, at the same time it increases in size by peripheral extension. In many cases this extension at the periphery continues until the spot attains a considerable size; at the same time the centre gradually returns to a normal condition, and produces appearances somewhat similar to those of ringworm of the body, except in the size of the vesicles at the spreading margin. The whole eruption was characterised by the grouping of the

lesions, their arrangement in annular form, or circles, as in ring-worm, by consisting of papules, vesicles, or bullæ, by intense itching, and by marked pigmentation upon their disappearance. The pigmentation, of course, was due to the escape of hæmoglobin into the tissues, in consequence of the scratching, more than from spontaneous haemorrhage, as very few bullæ contained blood. (*Journal of Cutaneous and Venereal Diseases*, No. 1, vol. iii.)

**Eruption from Iodoform applied externally.**—Professor Neisser has observed, within a brief period, seven or eight instances in which the external application of iodoform has occasioned an erythematous affection, characterised by the formation of small vesicles, and bearing a close resemblance to acute eczema. The applications were followed in a few hours by a redness of the surface acted on, gradually fading towards its edges, and accompanied by violent burning itching. Soon after vesicles filled with a clear fluid made their appearance, to be converted, according to their localities, and accidents (as scratching, friction of the clothing, &c.) which befell them either into moist crusty elevations, or circumscribed pustular patches of an impetiginous character. The degree of development attained by the complaint depended, of course, upon the duration of the drug-action, and the frequency of its repetition. The extent of surface affected, rather than the severity of the local manifestations, appeared to evoke the morbid process in all its intensity. The disease in question therefore may be defined as an acute dermatitis, or, more precisely, as a specific medicinal exanthem, in whose production a constitutional predisposition, or an inborn idiosyncracy, is largely concerned. The same results were found to follow, without important modification, from the use of every kind of iodoform, and whatever chemical impurities the article might contain. The mode in which it was applied, whether as a powder or an ointment, in solutions of ether or collodion, was equally a matter of indifference. It was enough for this purpose if the smallest trace of iodoform was present with the vehicle. Yet no such effects were produced, even in the most susceptible subjects, by the internal administration of the drug. (*Deutsche med. Wochenschr.* July 24, 1884; *Journal of Cutaneous and Venereal Diseases*, No. 2, vol. iii.)

**Lympho-sarcoma of the Tongue.**—The paper which Mr. Hutchinson contributed to the Royal Medical and Chirurgical Society on Tuesday last was one of much clinical and pathological interest. The case was that of a medical student who had had a morbid condition of the tongue, if not from birth, at all events from early life. The morbid condition would appear to have been one which, with Mr. Hutchinson, we may regard as a "congenital mole," having a tendency also to a nævoid

condition. Such hypertrophies of lingual tissues are not in themselves of very rare occurrence, but they are nevertheless of much importance as clinical objects of study in addition to their pathological relations, and the remarks on their structure by Mr. Butlin and Mr. Barker were of much value. The chief point raised by the paper in question would appear to be the development of a sarcomatous tissue in the ordinary course of the life of this hypertrophic condition. To all appearances the case which formed the chief part of Mr. Hutchinson's paper was one in which, in the first period of its existence, the disease had no malignant characters. And even later on, when the patient was first seen in London, there was nothing except the size of the tumour to excite much alarm about it. There was no ulceration and no glandular affection. The removal of this very large if not the largest tumour of the tongue on record (weighing seven ounces), could only be effected by a division of the lower jaw and preliminary tracheotomy. The operation was successfully accomplished, and the patient enjoyed the next two years of his existence apparently in the best of health. The microscopical examination alone caused any ground for alarm, for such skilled microscopists as Dr. Klein, Mr. Butlin, Mr. Godlee, and Mr. Eve all testified to its sarcomatous nature. And they were right. At the end of two years the growth recurred at the cicatrix, and caused death by its rapid development. The case is one of much interest on account of the great size of the tumour, the great rarity of sarcoma of the tongue, and also as an illustration of the occurrence of malignant disease on the top of a congenital and apparently innocent hypertrophy of certain of the lingual tissues. (*Lancet*, June 20, 1885.)

## Extracts from British and Foreign Journals.

### Glycerine in Febrile Dryness of the Tongue and Thirst.

—Surgeon-Major Cotter states that he has, in cases of enteric fever and other febrile conditions, found painting the tongue with glycerine eminently useful in relieving the distressing dryness of tongue and thirst which so often prevent the patient from obtaining sleep, and are in other ways a great source of discomfort to him. “Whether it acts,” he observes, “by increasing secretion from the mucous membrane, dissolving the sordes, or making an artificial coating, I do not decide. But in whatever way it acts, I can certainly vouch for its benefit when the tongue is parched during any disease.” (*Indian Medical Gazette*, January 1885.)

**Lactate of Quinine.**—M. Pierre Vigier states that for injection in gonorrhœa the lactate is the best preparation of quinine, owing to its greater solubility. His formula is lactate of quinine, 1 gramme; distilled water, 75; and glycerine, 25 grammes. About 5 grammes should be injected three or four times a day. M. Vigier takes the opportunity of recommending practitioners to employ the lactate in preference to any other preparation, whether for internal, external, or hypodermic use. It is the salt which is best adapted for every therapeutical application. (*Gazette Hebdomadaire*, February 6, 1885.)

**Ptomaines in Cholera.**—An original article contributed to the *Journal de Pharmacie et de Chimie*, by M. Villiers, gives an account of some investigations on the presence of alkaloids in the tissues of fatal cases of cholera. The tissues studied were the kidneys, intestines, liver, and the blood in the heart. The method of extracting the alkaloid was that of Stas. The alkaloid was obtained in fair quantity from the intestines, some traces were separated from the kidneys, but the liver and blood contained almost none. The alkaloid is liquid, possesses an acrid taste and has the odour of fresh hawthorn. It had the alkaline reaction, and its base could not be displaced by the alkaline bicarbonates. Iodide of mercury and potassium causes a white precipitate in its solution or those of its salts. Iodised

iodide of potassium gives a brown precipitate even in very dilute solutions. Bromine water, picric acid, chloride of gold, tannin, and bichloride of mercury give precipitates, but chloride of platinum and bichromate of potassium do not. Pure sulphuric acid develops a slight and fugacious violet coloration, The hydrochlorate of the alkaloid is neutral in reaction, crystallises in long fine needles, and is extremely deliquescent. The physiological effects in frogs were ill defined; in guinea-pigs very marked, and consisted of remarkable periodic variations in the frequency of the cardiac pulsations; the anterior limbs were remarkably convulsed three-quarters of an hour after the injection, and afterwards the posterior limbs were affected in a similar manner; the convulsions passed away, and the animal remained ill and died in four days. After death there were found subpleural ecchymoses; the heart was dilated and full of liquid blood; the brain was a little congested. M. Villiers believes that the alkaloid is formed in the intestines and excreted by the kidneys. (*Laneet*, April 18, 1885.)

**Pulmonary Arteritis.**—In an elaborate article on this subject Dr. Rattone formulates the following conclusions from a study of upwards of fifty cases: (1) Pulmonary arteritis may be either acute or chronic (atheroma), the latter being the more frequent. (2) It may be primary or secondary, the primary form not leading to cirrhosis of the lungs. (3) The cases seen by the author of acute arteritis had their origin from a primary inflammation of the semilunar valves. (4) Chronic inflammation or atheroma may be met with in any portion of the pulmonary artery, but is more often seated in the vessels of medium size, and especially at their points of bifurcation; it is distributed symmetrically in the two lungs. (5) In this disease there may be seen not only the atheromatous patches, but also abscess, ulceration, and in some cases calcification. (6) Pulmonary atheroma is entirely independent of a similar disease in the aorta; it may coexist with it, may exist without it, and may be absent when the aorta is profoundly diseased. (7) Pulmonary atheroma is met with constantly in mitral stenosis which has occasioned a certain degree of hypertrophy of the right heart; but may also be found with stenosis of the aortic orifice, in *cor bovinum* and other congenital defects. (8) The disease may occur in young subjects who have never suffered from heart-disease. (9) Atheroma of the pulmonary artery is a frequent cause of haemoptysis, and may also give rise to thrombosis and haemorrhagic infarction. (10) Finally, as regards the cause of atheroma, the author agrees with Martin that it is secondary to arteritis of the *vasa vasorum*. (*Archivie delle Scienze Mediche*, vol. ix. No. 2.)

**Precise Percussion.**—Dr. A. E. Sansom ably advocates greater accuracy in our method of percussion. "As generally adopted, its indications are only regarded as approximations to the truth about concealed organs, as relative rather than positive data." Piorry recognised eleven varieties of sound elicited by percussion, and thereby "imposed upon the ear a task of discrimination too great for the average human organ." To appreciate differences rather than recognise or classify varieties of sound, is the object to be aimed at. Hearing and the sense of touch convey the results of percussion, and in regard to this latter channel Dr. Sansom insists on the advantage of using a pleximeter, so held that the sensitive finger-tips rest on its horizontal plate. If the finger is used as a pleximeter, there is a sacrifice of percussion. "It cannot but be so; for the soft tissues act as a 'buffer' to arrest the vibrations that it should be our prime object to recognise." Applied to the heart, pleximeter percussion gives delicate results. Pericarditis gives one uniform note, so also does hypertrophy, but where there is dilatation, "it is quite possible to detect a thickening of the valves, when this is constituted by a dense fibrous material, or where there has been calcareous change." Repercussion may demonstrate very decided areas within an already defined area of cardiac dulness, "where the vibrations are in marked degree less pronounced than those over the general area," and "these islands of greater dulness may correspond very closely in position with the valvular orifices." The possibility of superficial thickenings—adherent pericardium, &c., giving rise to these, must be tested by collateral evidence. Equally delicate results follow the application of this method to the lungs. In Dr. Sansom's hands the pleximeter has detected an area of dulness, where auscultation and finger percussion yielded no abnormal sign, and the diagnosis was afterwards confirmed by other means. Our present knowledge regarding the phenomena of vibrations is limited, and Dr. Sansom pleads for a number of independent observations by those who will pursue them in the spirit of those who have yet much to learn. (*Liverpool Med. Chir. Jour.*, January 1885.)

**Cutaneous and Deep Reflexes.**—The tenth original article of the *American Journal of the Medical Sciences* gives the results of some observations on the cutaneous and deep reflexes. Dr. Philip C. Knapp of Boston, U.S.A., has examined the condition of the reflexes in 239 individuals admitted to the Boston City Hospital during the latter half of the year 1883. The points noted were the presence or absence of the different reflexes in each patient, together with a comparison of the reflexes on the

two sides of the body, and a rough estimate of the degree of contraction after irritation. The following are the conclusions at which the author has arrived:—(1) Absence of the plantar or cremasteric reflex is usually pathological, depending upon a direct lesion of the reflex arc or some cerebral disturbance. (2) Absence of the other cutaneous reflexes is not necessarily pathological. (3) Absence of the patellar reflex may be due to cerebral disturbance, especially in alcoholic subjects. (4) Ankle and patellar clonus are pathological. (5) The deep reflexes of the upper extremity are of frequent occurrence, and have no special pathological significance. (6) The costal reflex is found in the majority of cases without general exaggeration of the reflexes, and with no signs of phthisis. (7) When the reflexes differ on the two sides of the body, though it usually signifies some unilateral disease of the nervous system, it is not always pathological. On the whole, the above propositions accord with the observations of Buzzard, Gowers, and others who have worked most at this important question. That the patellar reflex may be absent from cerebral disturbance is most probably correct; nevertheless it would be difficult in many cases to exclude the possibility of a direct damage to the reflex arc itself. The frequency with which the deep reflexes of the upper limb are present in cases of disease of the brain and spinal cord has probably been overlooked as the result of imperfect examination; and we are disposed to agree with the conclusions of Dr. Knapp. (*Lancet*, May 23, 1885.)

**Treatment of Ringworm of the Scalp by Chrysarobin.**—Dr. Alexander found excellent results from the use of chrysarobin in treating an epidemic of ringworm in a public institution. In using the pigment of chrysarobin (of the strength of ten per cent. in liquor gutta-perchæ) it was hoped that three objects would be accomplished, viz.: the isolation of the patches of diseased skin, the exclusion of oxygen from the fungus, and the direct destruction of the latter by the action of the parasiticide. The method of using it was as follows:—The hair was closely cut or shaved on all the heads which presented scaly patches; the scalp was thoroughly cleansed, and epilation by forceps of the hairs on the spots and for a short distance around them was practised. This left a clear, bald spot, the centre and greater part of which was thickened, infiltrated and of a dark grey colour, contrasting sharply with the healthy skin around it. This discoloured area was then covered with a layer of the pigment applied with a stiff brush. Nothing further was done until the artificial cuticle began to crack, or until the growing hairs began to push their way through it. The application was then renewed, and this was done twice or thrice a week. No attempt to isolate the patients was made, and no other precautions taken except to

make them wear caps, to insist on frequent inspections and thorough cleanliness, and to attend to their general health. Cod liver oil or iron were administered to such as seemed to require them. The patients with few exceptions did well. The exceptions were rare instances in which a pustular dermatitis was set up by the pigment, and in these, of course, its use was suspended. In many of the fresh cases one or two applications of the mixture, without epilation, at once put an end to the disease. (*Journal of Cutaneous and Venereal Diseases*, vol. iii. No. 2.)

**Remedies for Skin Diseases in the form of Spray.**—Dr. Hardaway highly recommends spray as a vehicle in the treatment of affections of the skin. His usual habit is to prescribe a solution of definite strength from which the bottle of an ordinary hand-ball apparatus is filled and the patient is then directed to throw the fine spray on the parts affected. Any substance that is "sprayable" either in its liquid form, diluted or pure, or in a state of solution, may thus be employed, e.g., carbolic acid, sulphate of zinc, lotions of grindelia robusta, thymol, Liq. picis alkalinus, and fluid cosmoline, medicated or not. In the case of the fluid cosmoline, the tube of the atomizer should be large. The spray finds its greatest range of usefulness in diseases affecting large areas and in that class of disorders accompanied by itching and a more or less unbroken cuticle, viz.: pruritus, urticaria, papular eczema, and the like. In generalised pruritus he had had good results from spraying on a lotion of the following sort: carbolic acid, three to four drachms; glycerine, one ounce; and water, a pint. After the bottle of the atomizer has been filled, he sometimes directs the patient to add from five to ten drops of the oil of peppermint. The atomizer bottle should be thoroughly shaken before the bulb is compressed in order to diffuse the peppermint through the mixture, as otherwise it would merely float on top. In many instances the spray is far superior to mopping on lotions with a sponge or rag, being neater and less troublesome, getting the remedy more evenly and uniformly applied over the surface, and usually giving more speedy relief. (*Journal of Cutaneous and Venereal Diseases*, vol. iii., No. 4.)

**The Treatment of Traumatic Tetanus.**—In a communication on the treatment of traumatic tetanus, M. Verneuil recommends the following measures. Besides perfect rest, maintenance of warmth, seclusion in a dark and quiet room, and the administration of food in a fluid form, he employs chloral in large doses and insists on the advantage of combining this remedy with morphia. He also uses injections of the latter agent to arrest the characteristic convulsions and allay

pain. He does not relax the treatment during the periods of remission as such a proceeding is too frequently followed by a return of the convulsive state.

MM. Richelot, Ferrier, and Lee support the methods of M. Verneuil where these are practicable. In the most intense and rapid cases, however, there is not time for such deliberate measures. M. Richelot does not place morphia as a remedy for tetanus so high as chloral, and in common with M. Lee maintains as far superior in some cases to any other means of cure, the surgical treatment of the peripheral source of irritation, either by appropriate antiseptic dressings left for some time undisturbed, or by an amputation of the affected member. (*Progrès Médical*, May 23, 1885.)

**State of the Viscera in Epilepsy.**—M. Vulpian has communicated the results of certain experiments undertaken with the view of explaining the effects produced upon the action of viscera by epileptic seizures. He has induced fits of this kind in the dog by stimulating certain points of the sigmoid flexure. A few seconds after the convulsion began the heart-beats and the respiratory rhythm became slower, the latter even to absolute cessation, which was ascribed by M. Vulpian to a special excitation of the respiratory centre analogous to that produced by faradisation of the central end of the pneumogastric or superior laryngeal nerve. In the dog also as in man there is increase of the salivary secretion during the attacks. The amount of bile excreted is also in excess of the normal, while the passage of urine on the contrary is arrested. In a curarised animal it is possible to provoke epileptic attacks which are limited in their manifestations to the internal organs. The phenomena then apparent do not differ from those observed in the same regions during ordinary attacks of epilepsy. After the paralysis of the motor nerves of the voluntary muscles the effects of stimulation of the nervous centres continue to travel along the still available visceral nerves, and to give rise to modifications of heart action, contractions or dilatations of vessels and of the pupils, contractions of the intestine and bladder, alterations of secretion and the like. (*Progrès Médical*, April 25, 1885.)

**Removal of Small Pigment Deposits by Electrolysis.**—Dr. Hardaway remarks that the electrolytic current has a wide range of cosmetic application in dermatology. Besides its use in hirsuties, it is useful in warts, moles, small fibromata, milia, and cutaneous horns. It is equally effectual in scattered, very brown or black freckles. In these cases, one should quite gently and superficially prick the pigment deposit here and there with the point of a stiff electrolysis needle, taking care not to get

down to the corium, thus permanently removing the offending pigment without scar. (*Journal of Cutaneous and Venereal Diseases*, No. 4. vol. iii.)

**The Surgery of the Epiphyses.**—Mr. Wheelhouse in a recent lecture on this subject commences by showing how different the skeleton of an adult is from that of a child. Every long bone is developed in separate pieces, the central portion (diaphysis), and two extremities, called the epiphyses. These pieces are kept apart by a line of cartilage until the bone has fully grown; and it is to this part of the history of the growth and development of various bones and joints that the lecturer particularly draws attention. So long as the processes of normal growth proceed in a normal and healthy manner, the character of the bones and joints will be properly maintained; but in certain cases the epiphysis of one bone may grow more in proportion than that of an adjoining bone, and a deformity of the joint will result. Sometimes this deformity will be mistaken for an injury, and the patient will be subjected to surgical interference, which will only make the joint worse, whereas, if left to nature, some amount of compensation may result. Again, from early death, or injury, or absence of an epiphysis, one or other end of a long bone may fail to grow at all; and so the bone may remain in a rudimentary condition, and may thus present peculiarities of a very puzzling kind; also, by an unequal growth in parts of a bone, the whole may be more or less disfigured or rendered useless. Many cases of hip-joint disease occurring in otherwise healthy subjects have often been put down to strumous origin, whereas the author considers them to be due to some injury in the first instance. The method by which the bones are supplied with nourishment is commented upon, and it is shown how the ends of the bones grow by the epiphyses, whilst the shaft is developed in the main by subperiosteal growth. If this were not so, we should rarely see the recoveries we now look for; in many cases of necrosis the entire bone would come away, instead of only a part.

The lecturer then goes on to consider the relation of the epiphyses to dislocations and fractures; he supposes an injury to have happened to the elbow-joint, and apparently to consist of a simple dislocation backwards of the bones of the fore-arm; the age of the patient will help very materially in forming a diagnosis. If he be over twenty, there will be little difficulty either in reducing the dislocation, or in retaining the bones *in situ* after reduction: but it may be very different with a patient of more tender age. Here reduction may not be so easy, or, when it has been effected, it may be hard to keep the bones in position; and more careful examination reveals the

fact that the lower epiphysis of the humerus has been separated from the shaft, and that the whole joint, consisting of the epiphysis with the bones of the fore-arm attached to it, has been drawn up behind the stump of the diaphysis.

The treatment in these cases differs considerably; for, when the epiphysis is separated, the joint must be placed in a very firm apparatus, or displacement must recur, leading to a badly united and deformed joint. Mr. Wheelhouse quotes from a lecture by Professor Smith, in which it is pointed out that the idea of the tuberosities of the humerus belonging to the shaft of the bone is incorrect, and also adds that the lower epiphysis of the humerus does not include the condyles, which belong entirely to the shaft of the bone. The epiphysis includes nothing but the trochlea and capitulum. (*British Medical Journal*, March 7, 1885.)

**Buried Sutures.**—Mr. C. B. Keetley describes under this head sutures which are completely covered by the skin, and do not involve that structure at all; they are strongly recommended to be used in all operations in which deep structures are involved, and where rapid union is required. The use of these sutures enables operations such as excision of the hip to be performed without the use of drainage-tubes in the after-treatment of the wound. The method of applying these deep sutures is thus explained by the author. Suppose an operation to be performed with the object of uniting the two ends of a deep nerve that has been divided. After the ends of the nerve have been united, whatever muscles or aponeuroses had been divided in cutting down upon the nerve would be restored to their original relationships, and kept there by aseptic animal sutures; then the wound in the deep fascia must be separately sewn up, and finally the wound in the skin must be closed with catgut, or silver, or whatever is preferred. The results to be expected from this method of procedure are these: (1) There is no need for drainage-tubes. (2) The sutured muscles and aponeuroses are eventually restored as regards function. (3) Deep, rough, and depressed cicatrices are avoided. (4) Necrosis of bone and sloughing of soft tissues are avoided. The author also states that he has found these sutures very successful in dealing with sebaceous cysts of the head. Having dissected out three from the scalp of a gentleman, the remaining cavities were obliterated by two sutures in each, passing them well through the floor of each small wound. No cutaneous sutures were used at all; the skin-wounds did not gape. A little salicylic acid dissolved in ether, and a little powdered salicylic acid, were placed over the wounds. The patient went about his usual business, and a fortnight afterwards the scab was removed,

leaving three sound linear cicatrices. (*British Medical Journal*, May 2, 1885.)

**Diagnosis of Small-pox.**—Dr. A. Collie says that the chief difficulties met with in diagnosing this disease are: (1) The occurrence of scarlatiniform and measles rashes; (2) the varied forms of the eruption in the haemorrhagic varieties of the disease; (3) the want of clear views on the subject of chicken-pox; and (4) the practice of vaccination, which greatly modifies the disease. In the normal forms the most important factor in diagnosis is the element of time, as the rash has a characteristic appearance for each day of its existence. The haemorrhagic form may simulate scarlet fever, but is distinguished by the haemorrhages into the conjunctiva. The author divides the haemorrhagic forms into four classes, viz.: (a) *Variola haemorrhagica pustulosa*; (b) *Variola haemorrhagica vesiculosa*; (c) *Variola haemorrhagica papulosa*; (d) *Variola nigra*. Cases belonging to the first two classes are unmistakable. In the last two forms the purpuric spots are larger than the purpuric spots met with in other fevers, such as typhus. Measles in the early stage is very like some kinds of small-pox, but in small-pox, when the rash is so thick as to simulate measles, the hand passed over the face conveys the feeling of furrowed roughness, as on passing the hand over a piece of corduroy, whereas in raised confluent measles the sensation is as though the hand was passing over a piece of velvet. Glanders, accompanied by a pustular eruption, has been mistaken for variola; but in glanders the disease begins in the mucous membrane of the nose and respiratory passages, giving rise, as its first symptom, to a discharge from the nose, a symptom not met with in small-pox. (*Med. Times*, April 1885.)

**Effects of Impure Potassium Iodide.**—M. Huchard has treated a case of locomotor ataxy with iodide of potassium, administered in daily doses of a drachm. After the first dose the patient manifested symptoms of iodine-intoxication. The dose was then lowered to 12 grains, gradually increased to 15. Dyspnoea, with œdema of the glottis, became so urgent, that tracheotomy had to be performed, and the patient progressed favourably. The laryngeal spasm was evidently provoked by the œdema of the glottis, which was found to be due to the use of impure iodide of potassium, containing a certain proportion of iodates. Other patients, both in M. Huchard's and in other wards, manifested symptoms which could be attributed to the action of impure iodides; therefore it could not be supposed that this special patient was peculiarly susceptible to its influence. (*Brit. Med. Journal*, June 20, 1885.)

**Treatment of Ileus.**—The value and expediency of washing out the stomach in cases of intestinal obstruction, recently

advocated by Kussmaul and Senator, have been discussed at the Berlin Medical Society (*Deutsche med. Wochensch.*, Nos. 21, 22, 1885). Dr. Bardeleben had pursued the practice in cases of ileus, without in any instance obtaining a cure, and was impressed rather with the risk it gives of encouraging delay in resorting to laparotomy owing to the marked alleviation of symptoms which follows the measure. He also instanced the fact that symptoms of ileus frequently arise from conditions other than those of intestinal constriction, quoting a case of traumatic rupture of the bowel with peritonitis, and three cases of cancer, one of the pylorus associated with a large scrotal hernia, and two of the peritoneum, in which operations were undertaken for the relief of supposed strangulation. Such cases of course could not be benefited by washing out the stomach. Nor did he think it of much avail in true ileus. A man had a small inguinal hernia which he had reduced himself. Symptoms of internal strangulation arose, and in six days they became urgent. Treatment by opium, washing out the stomach, and enemata alleviated the symptoms for a few days, but on the sixth day laparotomy had to be resorted to. A constricting band was found and divided; but death ensued from peritonitis in five days. Bardeleben thought that a more favourable issue might have occurred if the operation had not been delayed, owing to the amelioration produced by washing out the stomach. In another case, in which the symptoms were severe and the abdominal distension great, the constricted gut was found to be gangrenous. The necrosed part was excised, and the divided ends of the bowel sutured, but the patient died the next day. In a third case, marked by a great distension, the seat of strangulation could not be detected on laparotomy. The bowel was opened at its lowest part, and much faeces escaped. This patient succumbed in two days from peritonitis and collapse. Dr. Schmid showed a specimen from a woman who had been ill for six weeks before admission into the Augusta Hospital. There had been complete obstruction for six days, and for two days faecal vomiting. The stomach was washed out five or six times, with transitory relief, but death occurred in twenty-four hours. The cause of the obstruction was found to be the inclusion of a coil of ileum in a loop formed between the large intestine and the uterus, which were firmly adherent to each other. There was commencing gangrene, and, owing to the adhesions, it was clear that an operation could not have given relief. Dr. Kuester related three cases simulating ileus. A woman had suffered a long time from vomiting, which became faecal. Washing out the stomach checked the vomiting, and nutriment could be taken; but the general condition not improving, laparotomy was performed, when the gall-bladder was found to have been perforated by a gall-stone. This was extracted,

the rent in the viscera sutured, and the peritoneal cavity cleansed of extravasated bile; but peritonitis was already present, and the patient died next day. Another case of gall-stone leading to peritonitis was also submitted to laparotomy without avail. In a third case, where vomiting had lasted for six days, the obstructing cause was found on examination to be a massive parametric exudation. The stomach was repeatedly washed out, and the patient recovered. Whilst agreeing that the measure entailed delay in operating, Dr. Kuester thought it useful in doubtful cases as an adjuvant to expectant treatment. Further, the ill success of laparotomy is often due to the great distension of the bowel; and the general condition of the patient is an index to its performance. Dr. Hahn had performed laparotomy in twelve cases of ileus, and in no case could washing out the stomach have given permanent relief. Where the procedure was of use was in cases of faecal accumulation, which could be just as well treated by ice-water enemata. Dr. Henoch, on the contrary, thought the palliative effect of the method a gain, and instanced a case where washing the stomach had succeeded when enemata had failed. He recommended its use in doubtful cases, and the resort to operation if the general condition was not thereby improved. Dr. Senator held that in cases where washing out the stomach palliated the symptoms, and in some of those in which a cure was obtained, there was not invariably obstruction from faecal accumulation in the large bowel; and he confirmed the statement that this measure had succeeded when enemata had failed. He still adhered to the opinion that it was a procedure of great value. Dr. Wolff would employ it not only to possibly remove the obstructing cause, but because by relieving the stomach from its faeculent contents it places the patient in a more favourable condition for operation. Dr. von Bergmann instanced the danger in faecal vomiting of secondary gangrenous pneumonia from inhalation, which washing out the stomach would obviate. In reply, Dr. Bardeleben admitted the difficulties in laparotomy, but insisted upon its being done early. He was not opposed to washing out the stomach, for he had done it in many cases. The main difficulty in these cases lies in the arrival at a clear diagnosis and the impossibility of formulating any general rule of treatment. (*Lancet*, June 20, 1885.)

## Notes and Queries.

**FERRIS AND CO.'S CODEIA JELLY.**—This is a pleasant-looking and pleasant-tasting preparation of codeia with glycerine, citric acid, and gelatine. We have tried it in a case of phthisis with hacking laryngeal cough, in which other remedies caused nausea. The soothing effect was marked, and the patient was so agreeably surprised that the jelly was finished almost too quickly. There is much shrewdness in the remark of Dr. Mahomed, of Bournemouth, who says of such preparations that "patients take them more readily than ordinary medicines, and if unrelieved are less prone to be discouraged." Many practitioners will welcome this useful compound.

**BURROUGHS AND WELLCOME'S COCAINE TABLOIDS.**—We have received two neat little tubes of tabloids containing each one-sixth grain of cocaine, made up with sodium sulphate. They dissolve readily in a few drops of water, and make an extempore hypodermic solution free from irritating properties and apparently dosed with accuracy. The difficulty of keeping solutions of the costly drug free from fungous growths is well known, and Messrs Burroughs and Wellcome's idea of making it up in the solid form is both happy and practical. The anaesthetic effect of one of these tabloids on the mucous membrane of the mouth or nose is prompt and unmistakable. A friend who suffers from hay-fever tells us his sufferings have been much relieved by putting one of the tabloids in each nostril on getting up in the morning. The hint is worth following up.

## ERRATUM.

*On page 17 (July number) for 5iii read 5iii.*

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\*.\* Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C.; WILLIAMS and NORRAGE, of Henrietta Street, Covent Garden, W.C.; or BAILLIÈRE, of King William Street, Charing Cross.

## Department of Public Health.

### THE RESULTS OF THE NOTIFICATION OF INFECTIOUS DISEASES.

(Continued from vol. xxxiv., p. 473.)

*Nottingham* (Nottinghamshire)—Population 186,575 in 1881. Compulsory powers adopted in 1878. Notification required both from the occupier and the medical practitioner. The former is only required to notify when there is no medical man in attendance, and the latter gives his notification to the occupier for transmission to the sanitary authority. The diseases to be notified under the Act are:—Small-pox, scarlatina, diphtheria, typhus, typhoid, and relapsing fevers, and cholera.

In a letter which the town clerk of Nottingham addressed to the Local Government Board in 1882 it is explained that, as the Bill was originally drawn up, the medical profession complained much of its stringency, and that it was in consequence of this that the notification clause was modified in the sense of only calling upon medical men to notify to the occupiers. “In the end,” however, “the medical men refused their assistance, except on condition that the Act became general law.” So matters remained until February 1882, when it was shown in a report by Dr. Seaton, then medical officer of health for the borough, that small-pox was being widely diffused for lack of information as to the occurrence of first attacks. Dr. Seaton concluded his report as follows:—

“It may not be generally known to the public that in the early part of last year the Health Committee, being desirous of carrying out this system, sought the co-operation of the medical profession, without whose cordial assistance they

felt it would be difficult to carry it out effectively. The question was referred to a committee of the medical profession, with a suggestion that a deputation should meet the Health Committee. For reasons which could not be entered into here, this suggestion was not adopted, but instead a resolution was forwarded to the Committee, of which the following is a copy :—

"At a meeting of the medical profession of Nottingham, convened by circular, on Friday evening, June 3rd, 1881, it was resolved—'That the medical men present, whilst admitting their duty as citizens to aid the State in whatever it deems necessary for the public welfare, and whilst satisfied of the importance of the notification of infectious diseases, deem it to be undesirable that the duty of notifying infectious diseases should be laid upon them until the difficulties associated with such notification have received full consideration in Parliament, and such duty is sanctioned by being the law of the land.'"

So matters stood until the date of Dr. Seaton's report, when the Health Committee of the Town Council asked the authority of the Council to put in force the provisions of notification of disease in the case of small-pox. The Council, however, extended the notification to scarlet-fever as well.

"Since that day (February 22nd, 1882)," says the Town Clerk, "the medical men have worked most amicably with the medical officer of health," and he adds that, between February 22nd and April 5th, when he wrote, 416 notices of infectious disease had been served on the medical officer of health, and seventy-two cases had been removed to hospital, this result having been obtained without the adoption of any compulsory measures.

As regards hospital accommodation, it should be explained that the buildings possessed by Nottingham are of an inferior description, having nearly all been erected during a small-pox panic in 1872 ; and that the site has certain objections, it being close to the workhouse, and it having been let to the guardians of the poor for the purposes of a workhouse garden. The arrangements for disinfection are, however, exceptionally complete, one of the best "Disinfecting Stations" in the kingdom having been established there.

Early in 1883, and when twelve months had expired since the clauses of the Nottingham Improvement Act relating to notification had been put into partial execution, Dr. Seaton presented a special report on the subject. He refers to some of the difficulties which had been met with in view of the exceptional circumstances which in Nottingham had attached to

the question, and he then adds, as regards the operation of the Act:—

“ As to whether, from a public point of view, the measure in its limited application has been beneficial in its operation or not? . . . I can only answer in the most emphatic manner that its results have proved beyond a doubt to be of great benefit to the public, and that the benefit would have been still greater if the other prevalent diseases named in the list . . . had been included amongst those which it was resolved should be notified . . . The notifications which have been received at the municipal offices have been filled up and signed by gentlemen engaged in various kinds of practice, including the senior physician to the general hospital, the senior surgeon to the dispensary, and the medical officers to other large public institutions. It should also be noted that they have come from members of every grade of society, from the mansions of the rich and the humble tenements of the poor; indeed, as far as the people are concerned, there is no reason to doubt that they are beginning fully to appreciate the advantage of this law, and the benefits they will derive therefrom.”

He then goes on to explain that the action taken under the Act had been the means of materially limiting the spread of small-pox and of diminishing its mortality, and he shows that the system of notification had afforded opportunity not only of securing better means for the isolation of the sick, but also of protecting those who had been exposed to infection, by vaccinating them efficiently with fresh lymph. Since, however, the system of notification had only been brought into operation after the small-pox epidemic had spread somewhat extensively, it was difficult to judge of the full influence of the newly acquired information, but it is at least noteworthy that, although ten years had elapsed since small-pox had obtained in an epidemic form in Nottingham, comparison of the mortality in the epidemics of 1871-72 and 1882-83 show that the latter outbreak was very much less fatal than the former. As regards scarlet-fever it is contended that notification had already shown itself to be most useful, and this especially by preventing children from infected houses from communicating the disease to others at school, by acquainting parents and others of the responsibilities devolving upon them; by securing efficient disinfection of dwellings, clothing, &c.; and by the adoption of special precautions in the case of certain trades, such as that of tailoring, laundry-work, &c. Information had also been supplied in certain cases as to other diseases than small-pox, and scarlet-fever, and the sanitary work which had become possible as the result of notification in the case of enteric fever is specially noted,

as a reason why the Town Council should no longer delay putting the Act in operation in its entirety. At a meeting of the Town Council held in May 1883, a request by the Health Committee that the Act should be put in force as regards small-pox, typhus-fever, typhoid-fever, and scarlet fever was agreed to.

*Oldham (Lancashire).*—Population 111,343 in 1881. Compulsory powers as to notification adopted in 1880. The duty of notifying devolves on the medical practitioner, and also on the occupier whether a medical man is in attendance or not. The diseases to be notified are:—Small-pox, scarlatina, diphtheria, typhus, enteric, and relapsing fevers, puerperal fever, and cholera.

In addressing the Local Government Board on April 6th, 1882, the Town Clerk adverts to the circumstance that before the Improvement Act of 1880 came into operation a system of voluntary notification existed, under which 2s. 6d. was paid for each certificate from a medical practitioner, and 1s. to school-masters and mistresses; but notwithstanding this there was "considerable difficulty" in obtaining the needed information. At the date of the letter in question, the compulsory system was working with "great regularity," and the opinion is expressed that the provisions of the Act had had a beneficial effect in arresting the spread of infectious diseases in the borough.

In the annual report for 1880 Dr. J. Maule Sutton, medical officer of health, refers to the Act as having come into operation, and he states that its provisions were working exceedingly well, and that the medical profession had responded with readiness to its requirements. In the report for 1881 the reference to the working of the Act is a very general one; the passing of the Act is regarded as a most important feature in the progress of the borough, and the advantages accruing from it are stated to be apparent on every side. In the 1882 report Dr. Sutton regards the "satisfactory returns of zymotic diseases" as being in great measure due to the "successful working of the compulsory notification of infectious disease and speedy removal to hospital," and he adds that he has found no opposition from the medical profession, but that on the contrary he has continued to work with them as harmoniously as heretofore. Before the report for 1883 was issued a change had taken place in the appointment of medical officer of health, and the report in

question contains no material reference to the working of the Act.

Oldham possesses an excellent hospital for infectious diseases, and also efficient means for disinfection, provisions which tend materially to aid in the successful working of a system of early notification of infectious diseases. Under these circumstances it would have been interesting to have noted how far success in securing early removal to hospital had been aided by the new powers acquired in 1880, by comparing the deaths from certain infectious diseases with the admissions into hospital. But this is unfortunately not possible, since the table in each annual report specifying the admissions does not distinguish between cases received from the borough and cases sent in by the Guardians of the Oldham Union from places outside the borough limits. The following statistics have, however, some bearing upon the question as to the influence of notification, although the period which they cover is too short to admit of any general conclusions:—

#### BOROUGH OF OLDHAM.

Date.	Population.	Death-rate per 1,000.		Articles destroyed or disinfected.	Houses disinfected.	Rooms disinfected.
		From all causes.	From "Zymotic" diseases.			
1878	107,366	25·6	5·4	5,403	502	1,552
1879	111,318	21·6	2·5	5,215	459	1,433
1880	108,880	24·6	4·3	6,902	439	1,318
1881*	112,176	22·7	2·3	8,809	583	1,797
1882	115,572	24·5	2·7	6,101	516	1,619
1883	119,071	21·9	1·5	5,317	358	1,072

\* Act first in operation for a completed year.

*Portsmouth* (Hampshire).—Population 127,989 in 1881. Compulsory powers only acquired in 1883. Notification required from the medical practitioner and also from the occupier whether a medical man is in attendance or not. The diseases

to be notified are those specified in the Memorandum in vol. xxxiii. p. 470. The Town Council of Portsmouth have recently provided themselves with excellent accommodation for the isolation of infectious diseases.

*Preston (Lancashire).*—Population 96,537 in 1881. Compulsory powers as to notification adopted in 1880. Notification to be made by the occupier and the medical practitioner in attendance, but only by the occupier when no medical man is in attendance. The diseases to be notified are:—Small-pox, measles, scarlatina, whooping-cough, typhus, enteric, and relapsing fevers, puerperal fever, and erysipelas. Power is also given to the Corporation to extend the provisions of the Act to other diseases.

The annual report for 1882 contains only a few general statements as to the operation of the compulsory clauses. Thus it is stated that as regards small-pox the importance of early notification was exhibited, and that, as to measles, the want of care shown by parents in allowing their children to come into contact with houses in which the infection was known to exist, in a great measure neutralised the advantage derived from the compulsory notification of fresh cases. The mean annual death-rate per thousand living for the previous ten years was 28·21, that for 1882 was 25·71. The diseases reported were; small-pox 5, typhoid fever 201, scarlatina 166, measles 991, whooping-cough 299, and diphtheria 10. No special reference is made to the isolation of cases of infectious diseases, but there appear to be special fever wards in connexion with the infirmary. During 1883 the deaths amounted to a rate of 23·79 per thousand, and it is stated that 784 houses in which some form of infectious disease existed were examined with a view to the removal of causes of disease. The cases reported were:—Small-pox 1, typhoid fever 263, scarlatina 280, measles 59, whooping-cough 90, and diphtheria 22.

(*To be continued.*)

REPORT ON AN OUTBREAK OF DIPHTHERIA IN  
THE VILLAGES OF AYLBURTON AND LYDNEY.

BY F. T. BOND, M.D. (MEDICAL OFFICER OF HEALTH).

THE following report was submitted to the Chepstow rural sanitary authority, in whose district Aylburton and Lydney are situated, on March 28th, 1885, and it relates to an outbreak which commenced in July 1884, and had not entirely ceased at the date of the report. Dr. Bond, having acknowledged the great amount of assistance which he had received from Dr. Currie during the course of his investigation, proceeds to give the results of an enquiry which affords an excellent example of the type of work which is necessary in the study of the etiology of this obscure disease. The report is as follows:—

"The first case of the disease which occurred in Aylburton was that of a young woman named Annie Thomas, aged 17, who was at the time living in an isolated house, some little distance from the main street of the village, and which was used as a beer-house.

"No definite source of infection could be discovered upon the premises, and no history of anything in the antecedents of the case to suggest even a suspicion as to its possible origin. There was, it is true, a badly-kept pigsty not far from the house, and some stale and offensive wash in a shed close to the sty; but it is difficult to see in the common incidents of rural life any explanation of the origin of a disease with such a specific character as diphtheria. The house itself, too, is reported to be somewhat damp, and it is situated in the lower part of the village, the soil of which in wet seasons is very likely to become water-logged; but in July, when the disease first showed itself, and in a season which was exceptionally dry, these conditions can hardly be looked upon as important factors in the problem, and the more so as abundant experience shows that diphtheria is by no means essentially, or even generally, dependent on dampness for its production.

"The girl in question made an apparently good recovery, and in the beginning of August was removed to her father's house, situated about two and a half miles away on the side of a hill; but on the 30th of that month she began to exhibit symptoms of spinal paralysis, which progressed steadily to a fatal issue on September 5th.

"The second case of diphtheria in the village occurred in the second week of September in the person of Ada Gillham, a child of  $4\frac{1}{2}$  years, who resided in a cottage at some distance from that in which Annie Thomas had lived; with whom she had had no communication of any kind. She was taken ill between five and six weeks after Thomas had left the village. This child had, previous to her attack, been on a visit to Newport, but enquiry failed to elicit any evidence of the presence of any suspicious illness in or near the house in which she had been

staying. This patient, during the later stages of her illness, exhibited well-marked paralytic symptoms, from the last traces of which she is not even yet quite free.

"From this time we may, I think, assume that the infection, whatever may have been its origin, had distinctly located itself in the village, and it will only be necessary in relating the history of the cases which followed to give them in the order of their occurrence, and to mention such facts connected with them as may have special interest.

"3. Gertrude L. Warren, aged 4½ years; resided about thirty yards from the preceding case, on the opposite side of the road. She sickened on September 19th, and died on September 24th, apparently of respiratory paralysis. This child had attended the village school, which is close by, immediately previous to her sickening, but she had had no communication of any kind with the child Gillham, who did not attend the school.

"4. Mary Ann Beard, aged 12, sickened on October 4th, and after a somewhat tedious illness, during the latter part of which she developed paralytic symptoms, she ultimately recovered. It is noteworthy that this patient lived in a good-sized house, which is occupied by two families on Aylburton Common, at a considerable elevation above the sea, fully exposed to the wind on all sides, and quite two miles away from the centre of the village.

"5. Louisa Hewlett, aged 5 years, sickened on October 3rd, and died on October 22nd. This patient lived on the opposite side of the road to case No. 2, but there was no evidence of any connexion between them.

"6. Ernest Hewlett, brother of the above, aged 2 years and 9 months, sickened on October 3rd and died on November 23rd.

"7. Elizabeth Hewlett, sister of the two foregoing, aged 10½ years, sickened on October 7th, and on October 31st developed paralytic symptoms, but ultimately recovered.

"8. Emma Hewlett, also a member of the same family, aged 13, exhibited symptoms of the affection on October 14th, whilst staying at her grandmother's house, but recovered after a mild attack.

"9. Stephen Cole, aged 4 years and 8 months, sickened on October and 8th, died on October 14th. This child lived in a cottage on Aylburton Common, about a quarter of a mile from that of the Beards, but there was no communication between the two, and the child had not been down in the village.

"10. Eva Beard, sister of case No. 4, aged 2½ years, sickened about October 23rd and died on the 31st.

"11. Anne Beard, another sister, aged 7½ years, sickened on October 23rd and died on November 6th.

"12. Alfred Jones Stevens, aged 10 years, sickened on November 2nd, and died on December 1st.

"13. Katie Came, aged 14 years, became a resident in the house occupied by the child Gillham (Case No. 2), on October 6th, but exhibited early symptoms of the disease about November 12th, and after a successive development of the more serious ones died on November 27th.

During the first week of November several suspicious cases of sore throat were reported in the village, chiefly amongst children, but they passed off without assuming a serious form.

"14. Harriet Cole, sister of Stephen Cole, aged 8 years, sickened about December 10th and died on the 16th.

"15. Charles Cole, of the same family, aged 3½ years, sickened at the same time with his sister, and died on December 19th.

"16. W. Cullis, aged 18 years, farm labourer; this youth lived in the Coles'

house, and sickened on December 18th. He developed successively all the characteristic symptoms of the disease, and died on December 25th.

"17. James Conock, aged 2 years. This child exhibited a remarkable phase of the prevailing disease. He had been suffering for some weeks from dentitional troubles, and on December 16th it was observed that he had a large eczematous patch beneath the right ear, which was covered with a thick tenacious white pellicle. There was also at the same time marked ascites, slight oedema of the lower limbs, puffiness of eyelids, albuminuria, absence of knee-jerk, and inability to stand or walk. The child eventually completely recovered and had at no time of his illness any throat troubles.

"18. Elizabeth Cullis, aged 40, mother of case No. 16, came to Aylburton Common a day or two before her son's death, and kissed him when dying. She began to fail on December 27th and subsequently developed various paralytic symptoms, but has now recovered.

"19. Alfred Charles, aged 9, began to fail on December 26th, and died on January 7th.

"This is the last of the cases of diphtheria that have occurred in the parish of Aylburton up to the present date; but this report would be incomplete without reference to the following cases which occurred subsequently in the neighbouring parish of Lydney:—

"20. Albert Henry James, aged 2 years and 9 months; living at Lydney Basin, some two miles from the village of Aylburton, was taken ill with diphtheritic symptoms about January 14th and died on the 22nd. The infection in this case was in all probability imported, either by the mother, who had helped to nurse her nephew William Cullis and his mother, and who herself had non-membranous sore-throat, or by one of the Cole children, who had been left at the James's, and played with little Albert James.

"21. Gilbert Smith, aged 2 years and 2 months, Wye Cottage, Lydney, situated a mile from the preceding case, with which there had been no communication of any kind. First seen by Dr. Currie on January 17th, when he was reported to have been ailing for about a fortnight, with slight gastric troubles, and exhibited at the time croaky breathing, but with no membrane on fauces. On the 19th, dyspnea becoming urgent, tracheotomy was performed, and death took place on the 21st.

"22. W. C. James, aged 5½ years, brother of case 20. Was under treatment from January 28th to February 11th when he died of diphtheritic laryngitis.

"23. A sister of the above, 8 years old, who was taken ill at the same time, has recovered.

"24. Albert George Bartlett, aged 2 years and 4 months, living at Lydney Cross, a point intermediate between Alyburton, Lydney Basin, and Wye Cottage, was under treatment from January 25th to February 13th, when he died. Throat affection never severe. Cause of death stated to be nephritis.

"25. Ada Rose Bartlett, 5 years, sister of above. Ill from February 10th and died on March 3rd of acute nephritis. Throat symptoms very severe at outset.

"26. George Smith, aged 3 years, living at Newern, nearly a mile from the preceding cases, sickened on March 3rd, when he exhibited a copious deposit on the tonsils. Next morning laryngitis set in, which proved fatal on March 6th. This child is reported to have been playing about an open drain at the back of the house on February 28th.

"The history of the epidemic given in the above summary of cases may be completed by the statement that in the earlier part of it, when there seemed to be no evidence of any probable diffusion of infection through the agency of the

village school, I saw no reason for closing it, but later on, when my attention was called to the rapid spread of the disease, and when it appeared doubtful whether the school might possibly be operating as a factor in the spread of it, I recommended that the school should be closed, which took place on November 3rd, from which date it continued closed until January 5, 1885.

*Origin of the Epidemic.*—It is unquestionable that the outbreak commenced in the month of July in the person of the girl Annie Thomas, who was certainly the first patient affected with the disease; but whence the infection was in her case derived, and whether the child Gillham acquired it from her, are problems over which much more doubt hangs. So far as the immediate neighbourhood of Aylburton is concerned there had been 100 cases of infectious illness for a long time before this outbreak; but cases of scarlet-fever were pretty frequent in Lydney during September and October, and have continued to crop up at intervals there since that period.

In regard to my opportunities of observation generally I may say that up to the latter part of the year, by which time the infection had become well domiciled in Aylburton, my district as a whole had been as free from cases of a distinctly diphtheritic character as it has been during the period (eleven years) for which I have been connected with it; a freedom upon which, in comparison with the prevalence of this disease in other parts of the country, I have more than once had occasion to remark in my annual reports. Since the establishment, however, of the infection at Aylburton, I have had evidence of a most remarkable succession of cases of diphtheria, occurring one after the other in various parts of my district, at considerable distances from one another, and mostly in more or less isolated cottages. The only exception to this sporadic character of these cases has been in the village of Down Ampney, near Cirencester, where, in the early part of the year, there were some dozen or more cases of a mild though distinctly diphtheritic character, which appeared to owe their origin to the importation of the infection into the neighbourhood by a girl, who seems in her turn to have caught it at the Cottage Hospital at Cirencester.

I have thought it desirable to refer to these facts, which are not directly connected with the Aylburton outbreak, because they indicate, in my opinion, the presence in the Gloucestershire

district generally, at a time that is at any rate only immediately subsequent to the origin of that outbreak, of an epidemic tendency, which, however obscure in its causation, has been certainly very distinct in its manifestations, and has given rise to a larger number of cases of this disease than have come under my observation during the ten previous years.

Whether this widespread epidemic tendency in any instance owes its origin to the Aylburton outbreak is a question which it is impossible to answer with any approach to certainty. My own impression is that it does not, and that it is due to causes of a much more general character, connected with the unusual climatic conditions that prevailed during the last summer and autumn, which are not unlikely to have generated an activity of microphytal growth, to some special forms of which the diphtheritic *oïdium* may in some obscure way be related. The tendency of the infection to attack isolated cottages, so well established as a characteristic of this disease, is well illustrated not only in the cases of the Coles and Beards, who live in houses of this description on Aylburton Common, but in various other cases which have since then come under my observation in different parts of my district.

It is noteworthy that I have not been able to learn that there has been any epizootic in the district during the last six months that can be brought into any relation with this epidemic tendency. The country has been free from foot-and-mouth disease, and only a limited amount of swine fever has existed, and that not at all in the localities where diphtheritic cases have occurred.

*Predisposing and Contributory Conditions.*—Whilst the origin of the infection is thus obscure, the conditions under which it has immediately operated are in the majority of cases hardly less so. The first case—that of Annie Thomas—occurred in a house which, as I have before indicated, though not by any means ideally perfect in its sanitary surroundings, is not distinguishable in regard to them from many others both in the village of Aylburton itself and in the surrounding districts. What seems more suggestive in connexion with the origin of this case is that it occurred in a beer-house, into which the infection may possibly have been introduced by some casual visitor.

But even if it be possible thus to account for the origin of the infection in the case of Annie Thomas, its recrudescence in that of the child Gillham appears to admit of no such explanation. For, as I have before stated, no connexion of any kind could be traced between these two cases, and the interval of time which elapsed between the departure of Thomas and the seizure of Gillham negatives anything like direct transmission of the infection from the one to the other. It is, of course possible that the germs of the infection, once introduced into the village in the person of Thomas, may have been propagated in dispersed secretions and diffused therefrom over the village generally. And there would have been some reason for accepting this hypothesis had not the subsequent remarkable multiplication of cases of a similar kind, in localities where it is impossible to suppose that the infection could have been imported from Aylburton, given ground for believing, as I have before suggested, in the operation of some influence of a much more widespread character.

But whether the second outbreak of the disease in the person of the child Gillham was due to infection communicated in some obscure way from the case of Thomas, or whether it was merely a curious illustration of the phenomenon of coincidence, the probability of direct transmission becomes thereafter increasingly probable. For the next case (Warren) occurred within a stone's throw of Gillham's residence; and although in this case, too, there was no evidence obtainable of direct communication between the parties, the distance is not such as to exclude the possibility of atmospheric transmission. The attack also, within a week afterwards, of the Hewlett family, who lived between Gillham and Warren, seems to confirm the probability that the infection had by this time got localised in some way or other in their immediate neighbourhood. But if so, how, it may be asked, did it find its way simultaneously to Aylburton Common, some two miles off, into the houses of the Beards and the Coles?

This question naturally suggests the suspicion that the village school, which was within a hundred yards of Gillham's house, may have been the vehicle of communication. In reply, I can only say that I altogether failed to discover any evidence of the

means by which this could have occurred. The child Gillham not only never went to any school, but was not allowed to play with other children; nor could I learn that any of those who lived in the houses of the children subsequently attacked had been into the house in which she lived, or had come in any way into communication with her. Whilst, therefore, I think that there is no reason to suppose that the school had anything to do with the diffusion of the infection in the earlier stages of the epidemic, and that its appearance at Aylburton Common, if due at all to the village centre, must be traced to infection incurred by the affected children passing through it, or when playing about in the neighbourhood of Gillham's house, it cannot be denied that the sudden expansion of the epidemic in the early part of November may have been caused by infection introduced into the school by some child in whom the disease was incubating, and there communicated to many of the children by the atmosphere of the school becoming thus contaminated; and I acted on this supposition in recommending its closure. On the other hand, it may, of course, have been caused by the operation of the same conditions as those which led to the original infection of the children Gillham and Warren, acting with increasing diffusiveness and virulence.

In regard to other possible media of diffusion, I may state that it was easy to eliminate those of drainage, water-supply, and milk; for drainage there is none by which even those cases which occurred in the centre of the village could be connected with one another; the water-supply is of the most varied description, and generally free from suspicion; and that of milk, where this article is used at all, equally so.

Of ordinary filth accumulations there were neither less nor more than are to be found in most villages of the same size; and though I found offensive privies and badly kept pigs in connexion with some few of the houses which were attacked, I cannot but think that they were accidentally rather than causally related to the infection.

Of dampness as a possible factor in the origin and dissemination of the infection, I can only say that, though I feel little doubt that the general rainfall of the autumn, coming, as it did, after a summer of an unusually dry character and high

temperature, had a great deal to do with the production of the widespread epidemic tendency, which, as I have stated, has prevailed of late in other parts of my district in common with Aylburton, I have discovered no satisfactory grounds for attributing the visitation of the disease in individual cases particularly to this agency, though in a few instances the houses affected were certainly somewhat damp in their foundations.

In conclusion, I regret to say that this outbreak, which, in the number of persons attacked, in the well-marked character of the disease, and in the fatality which attended it, is by far the most serious one which has ever come under my observation, has helped but little to elucidate the mystery which hangs over this most puzzling affection. One feature of it alone has come into unmistakable prominence, and that is the fact, that however doubtful may be the means by which the infection was in its earlier history generated and localised, it was unquestionably communicated from person to person, not only within the narrow limits of ordinary household relations, but over considerable distances, possibly through the media of infected garments ; but more probably through direct contamination by the breath of an infected throat.

In connexion with the pathology of the disease two features of this outbreak may be mentioned, which, so far as my own experience goes, possess special significance ; one is the infrequency of the copious white leathery exudation covering the tongue, roof of the mouth, and fauces, which is so generally described in the books as characteristic of its severer form, most of the cases which I myself saw having only a few small white patches on one or other of the tonsils ; and the other is the remarkable frequency of paralytic phenomena. The discussion of the possible relations of these two conditions to one another and to the renal symptoms, though deeply interesting, would be out of place here.

In regard to the preventive and precautionary measures adopted in connexion with the outbreak, I must confess that in default of the want of any means for removing the earlier cases and effectually isolating them, the only steps that were practicable and which promised any real good effect were to impress upon the friends of the sick the importance of excluding from

their neighbourhood all persons whose services were not essential to their comfort ; to inculcate the removal of infected articles and matters from the houses as early as possible, the disposal of infected secretions by burial ; and to prescribe the use of disinfectants so far as such agents could be employed with any prospect of real utility. With the valuable aid which Dr. Currie gave in enforcing these recommendations I have every reason to think that they were carried out as fairly as could be expected under the circumstances, and that no single case of the disease was caused by overt negligence of them. But it is impossible not to recognise in such an epidemic as this how large the difference is between what is theoretically possible and what is actually practicable in the way of cutting its infection short. To encourage the belief that such a disease as diphtheria, in which active medication and good nursing are as essential as nourishing food, can—when occurring in a cottage packed with a family of children, where no adequate isolation is practicable, and where the prescriptions of even the most enlightened treatment can rarely be properly carried out—be prevented from attacking those who are susceptible of its infection, or be exorcised by ordinary disinfectants, is to foster a delusion which is as prejudicial to the adoption of the only really protective measure as it is sure to be futile in its immediate results. Until sanitary authorities, and the public whom they represent, can be led to see that the provision of hospitals in which the earlier cases of infectious disease can be effectually isolated is the only trustworthy way of cutting short such outbreaks as this, and that common humanity, to say nothing of pecuniary economy, imperatively calls for them, or until the law, as the expression of the advancing intelligence of the nation, makes this provision compulsory, it is idle to think that such epidemics as this can be obviated, except by a happy combination of accidents upon which we have no right to calculate.

# THE PRACTITIONER.

SEPTEMBER, 1885.

## Original Communications.

### ON THE THERAPEUTIC VALUE OF THE CHLORIDE OF CALCIUM.<sup>1</sup>

BY R. W. CRIGHTON, M.D., EDIN., ETC.

*Formerly Physician to the Tavistock Dispensary.*

FEW substances really possessing marked therapeutic powers have had more turns on the wheel of fortune, or, more correctly, of fashion, than the old muriate of lime—the modern chloride of calcium. First employed by the French physician Fourcroy, as also by several Dutch and German physicians during the last century, it does not appear to have been much used in Great Britain till near its close, when strong testimony as to its efficacy in serofulous affections was given by Dr. Beddoes, Dr. Wood of Newcastle, Drs. Sanders and Hamilton of Edinburgh, and Dr. Anthony Todd Thompson. Soon, however, disparaging statements as to its therapeutic powers were made by Professor John Thomson of Edinburgh, Mr. Benjamin Phillips, and Mr. Samuel Cooper, of "Surgical-Dictionary" celebrity.

These great names prevented many from giving the drug a fair trial, and it gradually fell into disuse, till, in 1848, Dr. Neligan, in his valuable work *On Medicines* almost refuses it any therapeutic recognition.

<sup>1</sup> Read before the East Sussex Branch of the S. E. Branch B.M.A.

This neglect may also, in a great measure, be attributed to the introduction of the preparations of iodine by Coindet of Geneva in 1820, and to the powerful advocacy of cod-liver oil by John Hughes Bennett in 1841.

But, during this time, the remarkable powers of chloride of calcium were being patiently investigated by at least one individual, the elder Begbie, who bequeathed his large experience and rare therapeutic instincts to his son the late Dr. Warburton Begbie. In 1872 the younger Begbie wrote an elaborate paper (*Edin. Med. Journ.*, July) on its therapeutic action, in which he confirmed and extended its value in scrofulous and allied affections. Since that time the only contribution of similar value has been from the pen of Dr. Sinclair Coghill, of Ventnor, in the *Practitioner* for October, 1877. I have used the drug largely both in dispensary (while physician to the Tavistock Institution) and in private practice since the beginning of 1878, and can conscientiously say that, in suitable cases, I know of no other therapeutic agent that will produce the same good results.

And, among these, first in glandular enlargements of the neck in children, where the glands seem massed together, and are almost of stony hardness, and in which both iodine and cod-liver oil have failed to reduce the bulk.

After some weeks' patient use of the chloride, with careful attention to diet and general hygiene, there seldom fail to be noticed a softening and separation of the individual glands, and generally, in a few months, such a reduction in size, or complete disappearance in milder cases, as to warrant the term *cure* being applied to the case. On the discontinuance of the remedy, however, an increase of size often takes place, necessitating its continuance at intervals for a year or more.

I have found the chloride of calcium equally efficacious in cases where suppuration had occurred—in fact, one of the earliest cases which I treated thus was that of a lady aged forty, who from childhood had scarcely ever been many months free from suppuration of some of the cervical glands. These had generally been incised, and cod-liver oil and the preparations of iodine almost constantly taken. She had been under my care for several years with this unsatisfactory result, when, in May,

1878, she was treated with doses of chloride of calcium thrice daily. In less than three months all suppuration had ceased, and the enlarged glands had become much reduced in size. I ordered her to continue the medicine at intervals; and, much to my delight, learned from her several years afterwards, when attending her for some abdominal affection, that there had been no suppuration in the interval, and that, on observing any increase in size of the neck, she invariably had recourse to it. In *tabes mesenterica* the good effects are striking and lasting, if the disease is not too far advanced.

In pulmonary phthisis I have not found the chloride so useful as I had been led to expect from the reports of Drs. Wood, Sanders, and others (Dr. Sawyer, *Brit. Med. Journ.* 1880). I should recommend its employment in those cases only where there is evidence of the bronchial glands being decidedly enlarged.

In scrofulous caries I have witnessed quite as remarkable results from the prolonged use of the remedy as in scrofulous enlargement of cervical and other glands. One case which struck me particularly I shall give in brief detail.

Miss K. I., aged seven, born in India, first came under my care in the beginning of June 1879. She had been suffering from scrofulous caries of the ankle-joint for above a year, and was placed under my care to have her general health improved, previously to amputation of the foot being performed by one of the first surgeons in Exeter, who had seen her in consultation with her former medical attendant near that city.

The right foot was enormously swollen in front, with the pale, waxy-looking skin and enlarged veins invariably seen in such cases; while below and in front of each malleolus there were numerous sinuses discharging freely. The slightest movement of the joint caused great pain, and sleep was much disturbed, giving her a restless, irritable look. Her nutrition was evidently suffering seriously, for she was pale and thin. Her chest was sound, and the urine free from albumen.

On June 11th she was placed on chloride of calcium three times a day, with cod-liver oil at bed-time; locally, carbolic oil, 1-40, was applied. With the exception of an abscess which formed behind the outer malleolus (and was opened) the case

progressed so well that, after two or three months, the idea of amputation was abandoned, and in two years and a-half all traces of the former mischief had disappeared, save some rather extensive but firm cicatrices in front of, and below, each malleolus. The movements of the ankle-joint were perfect, although both the os calcis and astragalus, with the scaphoid bone, had been evidently involved.

Scarcely, however, had this good result been attained in the case of the ankle-joint, when mischief showed itself in the form of an abscess just in front of the articulation between the trapezium and the metacarpal bone of the right thumb. This was treated in a similar manner to the ankle, and after varying stages of improvement, became quite healed, without any impairment of motion, in about eighteen months. But the efficacy of the chloride had, in this case, to be still further tested ; for soon after an abscess formed over the *crest* or internal surface of the left tibia, about its middle, with all the characteristics of the scrofulous type.

This was very discouraging ; but a perseverance in the same line of treatment afforded the gratifying result of a complete cure.

I have seen this patient, who is now in Eastbourne, on the 12th of August, in perfect health, without the least impairment of any movement in the affected limbs, and with the cicatrices firm and depressed—that on the tibia more so than the others, for there was in that situation molecular discharge of a certain amount of bony tissue, though never any appreciable sequestrum. She still continues to take the chloride of calcium at intervals.

If asked to offer some explanation of the action of chloride of calcium in the morbid states which I have mentioned, I should in general terms refer to the activity of the chlorine compounds, and to the especial function of lime in the assimilative and nutritive processes.

Chloride of calcium is one of the normal ingredients in the saline constituents of the blood, and is present in the gastric juice, so that, administered after a meal, it may reasonably be supposed to aid digestion ; while the presence of free chlorine, which would inevitably be disengaged in the alimentary canal during acid conditions, might probably be valuable as an antiseptic.

The salt is apparently the only active ingredient in some mineral waters, among which may be mentioned Bridge of Allan, Pitcaithly, and Dunblane.

Dr. Sydney Ringer, in some recent experiments (on the effect of the saline ingredients of the blood on the contraction of the heart, *Brit. Med. Journ.*, April 11th, 1885) has thrown some light on the therapeutic action of chloride of calcium. He invariably found that when the heart of the frog had been subjected to the action of fluids, such as water or a solution of common salt (same proportion as in blood), the ventricular contractions grew weaker and weaker, till at last contractility ceased, and the ventricle stopped in diastole, and a contraction could not be induced even by a strong galvanic induction shock. He adds that the only constituent which will restore the suspended contractility is lime; and on adding 1 part of chloride of calcium to 10,000 parts of saline solution, spontaneous contractions return, and the ventricle very soon begins to beat as strongly as ever. Any potassium salt has an opposite effect.

This action in many cases of scrofulous disease must be highly valuable in slowing the circulation and in acting as a cardiac tonic; while iodide of potassium would have a decidedly contrary action. Valuable as iodine and cod-liver oil are in many cases of the large class of diseases comprehended in the term "scrofulous diathesis," I yet claim for the chloride of calcium, in certain instances, a special therapeutic power which neither of them possesses, and, in all cases of this diathesis, the merit of a valuable *alternative* remedy.

In conclusion, I would add a few words on the doses and mode of administration. I have always prescribed the crystallised chloride of calcium, as the anhydrous salt forms a turbid solution, and has an unpleasant taste. The recognised dose is from ten to twenty grains, or even more; but I have generally given a smaller one—one, two, or three grains for young children, and rarely over twelve or fifteen for adults. The formula which I have adopted is that recommended by Dr. Coghill, viz.:  $\frac{3}{5}$ v of the crystallised salt in fluid  $\frac{3}{5}$ xii of syrup. The dose of this solution has varied from min. v. to min. xl, according to age and other circumstances. I have always given it in milk after meals.

## A NEW SURGICAL DRESSING.

BY ROBERT PARK, M.D.

FOR some time now past I have been using for the dressing of sores and ulcers, a powder composed of burnt kieselgühr and iodoform, to which a varying proportion of eucalyptus oil or other odorating substance is added.

Kieselgühr, it may be mentioned, is a diatomaceous earth, and is otherwise known as white peat. When this is burnt in a furnace an extremely light powder is the result, composed entirely of inorganic ash, varying in colour from pure white to a pinkish tint. It is extremely absorbent and antiseptic.

As a diluent for iodoform it has no equal: and as it is much cheaper than the latter, it is economical in use. For insufflation it is admirably adapted, owing to its lightness and absorbent powers; and it has been thus prescribed by me in naso-pharyngeal affections, and in gynaecological practice. Upon the whole, I have been well satisfied with the results.

For cases of chancroid it is better adapted than iodoform alone, in the proportion of equal weights. In this form indeed it is adapted for dressing either the soft or the hard sore.

As a dusting powder in erysipelas, erythema, and eczema, its advantages over starch and other powders are owing to its great power of absorbing moisture; but its extreme lightness is against its use *alone* for this purpose.

Mixed thoroughly with absorbent cotton-wool it adds greatly to its absorbent power, and furnishes it with detergent and antiseptic qualities. In this manner it forms an excellent elastic dressing for boggy ulcerations.

There are many other uses to which this remarkable substance will be found adapted by practitioners when they have become acquainted with it.

The process for burning the peat has been patented in this country and abroad, but I believe the powder can be had through any wholesale house, or direct from the Pure Peat Powder Co., 327, Argyle Street, Glasgow.

## THE ACTION OF NITRO-GLYCERINE ON NEPHRITIS.<sup>1</sup>

BY P. B. BURZHINSKI.

*Translated from the "Vrach," St. Petersburg, by THEODORE MAXWELL, M.D. CAMB., B.S.C. LONDON.*

IN the *Berliner klinische Wochenschrift*, No. 3, of the present year, there appeared an article by Prof. Rossbach, reporting

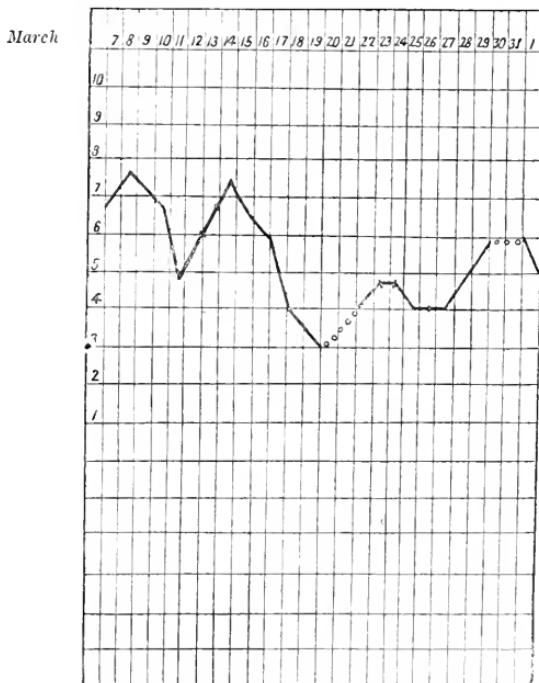


FIG. 1.—Curve showing in Grammes the amount of Albumen per diem.

interesting results from the treatment of interstitial nephritis with small doses of nitro-glycerine. Under the influence of the

<sup>1</sup> Observations made in the Therapeutic Clinic of Prof. B. A. Manassen.

nitro-glycerine the urinary albumen eliminated by the kidneys diminished, while the quantity of urine increased. Rossbach also observed a beneficial result from the drug in cases where there was haematuria, both in the ophthalmoscopic appearances of the fundus oculi as well as in other symptoms accompanying nephritis.

Rossbach examined the action of nitro-glycerine, amyl nitrite, and the nitrites of potassium and sodium, and gave a decided

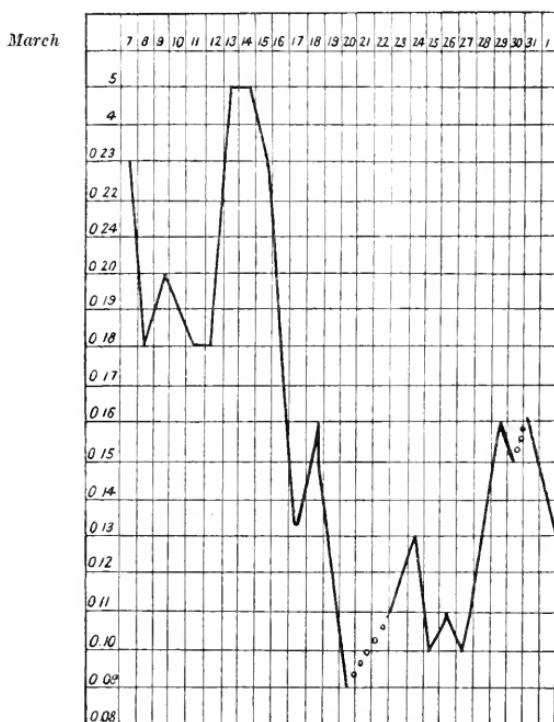


FIG. 2.—Curve showing the percentage amount of Albumen.

preference to nitro-glycerine, calling it an "excellent remedy" in interstitial nephritis, "prolonging life and cutting short grave attacks."

Having under my care three cases of chronic nephritis, I gave them, without making any change in their surroundings or diet, small doses (0.005 to 0.01 gramme daily) of nitro-glycerine, noting the quantity of urine, the specific gravity, the proportion of albumen by weight and the weight of the patients; a certain

dose of nitro-glycerine being given during a few days. I here state such results as are possible from these few cases, reserving until the publication of the completed research an account of the literature of the question, of the details of the disease, and of the explanation which I think may be offered of the beneficial action of nitro-glycerine on the formation of urine and albumen in nephritis.

In order that my observations may be the better understood at a glance, I append diagrams as well as the actual figures corresponding to the results obtained in one of the cases.

*Name D...GAN. Case of Chronic Interstitial Nephritis.*

Day of Month.	C. centim. Urine.	Spl. gravity.	Grammes Albumen per diem.	Percentage Albumen.
March.				
7	3·070	1·013	7·061	0·230
8	4·710	1·009	8·779	0·186
9	3·300	1·014	7·131	0·216
10	2·910	1·011	5·575	0·191
11	2·000	1·011	4·080	0·180
12	3·010	1·012	5·658	0·188
13	2·800	1·011	7·000	0·250
14	3·020	1·011	8·000	0·250
15	2·830	1·011	6·509	0·230
16	3·550	1·009	6·248	0·176
17	3·130	1·009	4·382	0·140
18	2·250	1·012	3·645	0·162
19	3·450	1·009	3·243	0·094
*20	...	...	...	...
*21	...	...	...	...
22	4·400	1·009	4·104	0·116
23	3·500	1·010	4·090	0·134
24	4·500	1·007	4·590	0·102
25	3·800	1·010	4·332	0·114
26	3·850	1·008	4·081	0·106
27	3·700	1·009	4·306	0·118
28	3·550	1·012	6·106	0·172
29	4·400	1·008	7·216	0·164
30	2·650	1·014	—	—
31	4·100	1·011	7·216	0·176
April.				
1	3·900	1·010	5·070	0·130

\* Urine not examined.

The results hitherto arrived at are as follows:—

1. Nitro-glycerine in small doses diminishes the quantity of urinary albumen passed per diem and still more markedly the percentage of albumen in the urine.

2. The diurnal quantity of urine is perceptibly increased by nitro-glycerine, this increase persisting some time after the nitro-glycerine has ceased to be given.

3. Gradually increasing doses of nitro-glycerine influence still more decidedly the formation of albumen.

4. I have been unable to determine the influence of nitro-glycerine on the weight of the urine, the weight of the patients, and on the dropsy.

5. With the exception of slight and transient headaches, nitro-glycerine does not give rise to any disagreeable symptoms.

Further observations which are still in progress will show whether the continued action of nitro-glycerine is always such as I have stated, or whether it is so in the majority of cases only. I am also conducting observations to show how the weight of the urinary albumen depends upon the quantity of liquid drunk, the quantity of urine passed, the use of alcoholic liquors, &c.

## CASES OF SCURVY IN INFANTS.<sup>1</sup>

BY W. E. GREEN, M.R.C.S. ENG., L.S.A.,

*Sandown, Isle of Wight,*

*Surgeon to the Isle of Wight and Newport Junction Railways.*

I FIRST saw Mrs. B.'s baby, aged twelve months, July 29, 1884. The child was teething, and apparently suffering from inflamed gums, which I was requested to lance.

The following history was elicited :—The patient is the fourth child of parents, one of whom was a dyspeptic with a rather weak condition of heart and lungs; the other, afflicted with diabetes. The child had been remarkably strong and healthy up to the age of nine months. About that time it had been arranged for the family to remove to Sandown, and for some weeks the baby, who had been brought up by hand, was sent with a nurse to stay with a friend. The mother did not see it for more than a month, and, when she saw it, noticed it had gone off in health. Thinking, however, that the change to Sandown would remedy this, another month passed before medical aid was sought, when the child was found in the following condition :—Pale and flabby, with puffy, expressionless features, and bright, pearly-white conjunctivæ. The two upper and lower central incisors were cut, and the two next in the lower jaw were prominent in the gums, which looked inflamed, but with bluish-red petechial patches on the edges, the like of which I had never seen before. There was no fever, but the child appeared restless and in pain. The tongue was coated in the middle, but the bowels were acting daily and copiously, therefore I did not order any aperient medicine. Contrary, however, to my usual custom, thinking it might relieve the turgescent condition. I lanced the gums. I found that the child had been

<sup>1</sup> Read at a Meeting of the Isle of Wight District Branch of the British Medical Association.

fed on "Ridge's food," made with sweetened condensed milk. Believing the quality of this not sufficiently good I ordered "Savory and Moore's food," prepared with unsweetened condensed milk. On my next visit,

*July 31*, I found the patient still restless and irritable, the gums looking more inflamed and the tongue more coated. Mixture given containing chlorate of potass. and cinchona with glycerine.

*Aug. 1.*—No improvement; gums worse; to be painted freely with glycerine of chlorate of potassium; iron to be added to the mixture. The new food has been taken with evident relish; ordered half a wineglassful of the juice of raw meat every day. I told the mother there was evidently a low condition of vitality about the child, and that had I met with such a case in an adult I should have considered it one of scurvy.

*Aug. 3.*—The child was worse; gums more swollen and ulcerating; tongue foul, for which a powder of hydrarg. & cretâ and rhubarb was given; small bullæ now made their appearance on various parts, especially on the scalp.

*Aug. 4.*—No better; mixture of amm. carb., pot. chlorat. and cinchona.

*Aug. 5.*—Worse; weak solution of arg. nitrat. to gums.

*Aug. 6.*—Small doses of hypophosphite of strychnine were given in addition to the above mixture, and for some days the child appeared brighter, but the gums were no better.

A few days later, swellings in various parts of the extremities and nodes over the tibiæ, but no appearance of fluid. The epiphyses of the joints were also enlarged, and the child was in a great deal of pain when moved, but apparently comfortable at other times. The gums had increased enormously in size and were in a very sloughy condition, the breath being peculiar and offensive. At this time my partner saw the case with me, and suggested what had previously occurred to my own mind, viz., the possibility of specific mischief. Owing to the position of the parents I hesitated to ask the question, but ordered a small quantity of oleate of mercury to be rubbed into the abdomen every day. I soon discovered that this treatment was useless, as the patient was constantly getting worse. Accordingly the tonic treatment was resumed and the following given:—Arseniate

of strychnine, arseniate of quinine, arseniate of iron, ferrocyanide of quinine, of each one milligramme; hydrobromate of quinine, one centigramme, six times a day. At this time the child was continuing the extract of raw meat and "Savory and Moore's food," now prepared with fresh cow's milk.

Two days later the child began having purpuric spots, and copious haemorrhages took place from the gums, so I called in Dr. Williamson, of Ventnor, to see the case with me, into which we went very thoroughly.

Dr. Williamson said, "Well, if this were in an adult, and at sea, one would say at once that it was a case of scurvy." This was also my own opinion, and on looking into the details we saw no reason why our idea should not be correct.

Dr. Williamson suggested the addition of lemon-juice to the dietary, the medicines and food as before. Knowing that lemon-juice could not easily be given to so young a child, I proposed a wineglassful of grape-juice, which had the advantage of being pleasant, yet containing plenty of potash salts. This course was adopted, the juice was taken with avidity, and an immediate improvement took place in the condition of the patient. There were several haemorrhages for nearly a week, but still the general condition improved, the gums began to heal, the purpuric spots disappeared, the swellings rapidly decreased, and in a week the child had become bright and cheerful. At the end of a month the patient was much better and taking all food with a relish, with the exception of the meat extract and grape-juice, of which, now the need for them was gone, it appeared to get tired. At present the child is fat, healthy, rosy, and bright, and apparently little the worse for all it has gone through.

I have thought it advisable to bring this case to your notice as scurvy is rare in the present day, and in so young a child almost unknown, more especially when the position in life of the parents is taken into consideration. It is my object also to emphatically warn against the mischievous and increasing habit of using artificial foods in the rearing of infants, and more especially against the use of the condensed milks so easily obtained. I have myself used them for years, but with an increasing conviction that they are not good tissue-forming foods, and that only in exceptional circumstances should they be used

in preference to properly diluted fresh cow's milk. It is true that Swiss milk, and especially the sweetened kind, produces very fat babies, but such fat is not of a healthy type, and I have often been struck with the rapidity with which it disappears after only a few days' illness, "melting away like butter in the sun." Infants so fed do not bear even slight illnesses as well as those fed on either mother's or cow's milk, and moreover are very apt to succumb entirely to more acute ailments.

Since writing the above my attention has been directed to a series of cases, by different writers, of infantile scurvy, mentioned in Cassell's *Year Book of Treatment*, in all of which it appears to have been produced by feeding upon artificial foods. The following is another case of the same disease which has since occurred in the practice of my partner, Dr. Barker, to whom I am much indebted for the notes :—

L. B., aged thirteen months, was brought to me early in May with the following symptoms: The little patient was crying feebly but persistently, especially after being moved. He was lying on a large pillow, from which he had not been moved for three weeks; the legs were drawn up towards the abdomen, and the knees bent; the skin was of a dusky hue, with small patches of ecchymosis about lips; face flushed and bright; conjunctivæ of a pearly lustre. On opening the mouth to look at the teeth a sickening sight was seen—a small quantity of discharge of a bloody and purulent nature escaped through the tightly-closed lips; the gums were much swollen and fetid, and no teeth were visible. Pulse 140, temperature 100°1. On examining more carefully, there was a considerable disturbance of the lymphatics of the legs and thighs; several hard and painful swellings of a dull red colour.

The child's mother gave me an account much as follows :— Child born at full time and healthy; was quite well for ten months; first tooth came at seven months, then others at intervals without trouble, till at ten months the child had "cut" seven altogether. After this the appetite failed; and on asking what food was given I learned that, not being able to nurse the baby, the mother had fed him exclusively on corn-flour mixed with milk, and as much as the child could take, without any regard to quantity or time of taking meals, in fact whenever the child

cried, so often was the bottle brought into use. When about ten months old, some blood was first noticed about the lips, and on looking into the mouth the mother saw the gums to be swollen and red with, what she thought to be, small ulcers. She then sought medical aid. One doctor lanced the gums, which bled freely, but with no good result. Another called the disease acute rheumatism, and administered amongst other remedies salicylic acid. No good came, and as a last measure sea air was advised.

Having had an opportunity of seeing the case of my friend Mr. Green, and of learning how it yielded to treatment for scurvy, I had no hesitation in giving a decided opinion. The child was put into a hot bath every night, wrapped up in cotton-wool afterwards, without dressing, and the food at once discontinued. Cow's milk with half water was given at intervals of two and a half hours during the day and once in the night. Some grapes were obtained, and the juice expressed and mixed with a small quantity of water, and given *ad libitum*. For medicine, nothing but a grain of grey powder every other night. In a week the limbs were much better. Some teeth were visible, the guns having subsided considerably ; the bleeding had ceased ; the pulse was down to ninety, and the temperature normal. After a time pure milk was given without any water, and no alteration in treatment. At the end of one month the child was quite well with a clean healthy mouth and nine teeth.

I attribute the attack to the exclusive use of one food.

## SHORT NOTES ON THERAPEUTICS.

BY H. MACNAUGHTON JONES, M.D., F.R.C.S.I. AND EDIN.,  
*Examiner in the Royal University of Ireland.*

(Continued from p. 111.)

### AURAL THERAPEUTICS.

IT is not so long since, when in conversation with an eminent surgeon, he thus briefly and tersely differentiated the causation, diagnosis, and prognosis of aural affections. "We may simply," he said, "divide all cases of deafness into wax and no wax; wax curable, no wax incurable." Did this assertion come within measurable distance of the truth, the therapeutics of aural affections would indeed be simple, and, as in days gone by, a syringe with soap and water would constitute the entire armamentarium of the practising surgeon. And I regret to say that there is still a belief, widely diffused, that there is something mysterious, or at the least most intricate, connected with the treatment of morbid states of the auditory apparatus, and this fear is expressed in the familiar injunctions given to sufferers "not to tamper," "to avoid meddling," "to let well alone," while these sapient precepts are perhaps carried into practice by the mischievous syringing on an exposed drum-head, or the dirty and dangerous practice of dropping greasy or fungus-generating fluids into the external meatus. Surely the time for all this excusable empiricism of our forefathers has long since departed. The time has arrived when aural therapeutics should be completely freed from the atmosphere of charlatanism, which, in the minds of many, pervades the treatment of diseases of the middle and internal ear, and that the care of this most important organ should be as intelligently and rationally carried out as that of the uterus,

the male urethra, or the rectum. It would be easy to prove that the certainty of diagnosis is as perfect, both from positive signs and symptoms and from negative evidences, in the case of aural affections as in morbid states of other organs in the body. A glance at the method by which an exhaustive examination of the ear is conducted and a final verdict given, as detailed in any aural text-book, must satisfy any one on this point. For my part, I know of no organ in which we can arrive at more certain and satisfactory conclusions as to the cause of aberration or loss of function. He would indeed be a rare diagnostician who would not acknowledge that in the case of the other organs of sense or of the internal viscera, conditions are occasionally met with which baffle his knowledge and contradict his experience. The oculist and dermatologist have manifest advantages in the completeness of their survey of the diseased states they treat, and their powers of observation and comparison are accentuated by this facility and education. But even in the instance of the eye and the skin, intricate questions of pathology which involve the diagnosis are constantly arising, and these baffle the localising power of the examiner, and, more or less, influence his judgment on matters of therapeutical import. It is not an exaggeration to say that the vast proportion of curable or remediable affections of the ear are most easily diagnosed and require no extraordinary skill in their treatment; and these are just the conditions which come within the daily observation of the practitioner. I shall establish this assertion by a short analysis of 500 cases taken consecutively from my private notes, and occurring in private practice. As I write these present notes from an experience derived from the treatment of some 5,500 aural patients in hospital and private practice—and by far the larger proportion of these patients had both ears affected—I consider the general judgment arrived at from this experience worth recording. Nor are the necessary appliances for an accurate aural diagnosis either numerous or costly. A watch, a few ear specula, a piece of rubber tubing, a mirror, a tuning-fork, a syringe, an aural probe with some cotton-wool, a tongue depressor, and in some cases, a small Siegle's speculum, and Polityer's aural bag, are the essential tools, which enable us, in the great majority of cases, to tell the patient truthfully what is the matter and what are

the chances of successful interference. But what I have to say relates to therapeutical principles and I must confine my remarks to these. Before stating, however, those general principles on which our decision of the details of aural treatment must depend, I would ask a glance at this first classification of these 500 cases, which I divide into three heads, (*a*) affections of the external ear and meatus, (*b*) affections of the middle ear, including the membrana tympani, its muscles, the ossicles, the Eustachian tube ; (*c*) the internal ear, including the labyrinth and auditory nerve. In a subsequent "note" I shall more fully classify the various morbid conditions from which these patients suffered. In tabulating these affections I have placed each patient under that division which the most prominent symptoms and physical signs justified me in regarding as including the primary or principal seat of the disease and the part mainly involved. Obviously, in so large a number, where, as a rule, both ears were affected, other structures and parts were involved than those which determined the final assignment of the case. This is one of the circumstances which makes the accurate classification of aural diseases so difficult. The removal of cerumen may disclose a perforation of the drum-head or some old catarrhal state, with its secondary intra-tympanic consequences, and further examination may demonstrate internal ear complications. A patient, on the other hand, may have the slowly progressive history and proofs of Eustachian deafness, resulting in both internal and middle ear mischief, but in whom all the evidence, aided by that derived from a throat examination, points to tubal collapse, innervation, or obstruction, as the principal source, both past and present, of the affection. The skill of the aurist mainly consists in his power of comparatively analysing and differentiating these associated morbid conditions and in assigning relatively to each its proportionate part in the production of the symptoms for which he is consulted. He has frequently to decide how far the removal of those abnormal states which he knows to be remediable by operative or therapeutical measures will enable him to improve his patient's hearing, or, just as important a result, to preserve it. In a certain proportion of cases he must feel, no matter how large his experience, that the chances of improvement are against him ; in another number he

knows absolutely that no good whatever can be done. Frank admission in the case of both these classes of sufferers would save aural surgery from much of the suspicion of quackery, which at present is pretty openly hinted at, in regard to its therapeutical remedies and applications. "Don't you find aural practice very unsatisfactory in its results?" is a question which has been frequently put to me. And my reply, "Most decidedly not," has appeared to astonish my interrogators. I make the same response now, in a comparative and relative sense, taking into consideration the amenability of other organs to treatment and remembering the proportionately large number of cases which are constantly occurring, and which we must register as incurable; I care not what organ is instanced.

In the subjoined Table (No 1) thirty-three patients are registered under two of the three divisons. I have also collected the entire number of patients from whom cerumen was removed and those whose naso-pharyngeal tract was manifestly diseased.

TOTAL NUMBER OF CASES, 500.

External Ear, including meatus . . . . .	142
Middle Ear, including the membrana tympani, the cavity of the tympanum and Eustachian tube . . . . .	291
Internal Ear, including the auditory nerve and labyrinth . .	95
Mastoid process . . . . .	5
TOTAL . . . . .	533
Cerumen present . . . . .	92
Naso-pharynx affected . . . . .	88

This short table speaks for itself. In the first place it shows that more than fifty per cent. of these patients had middle-ear trouble of one kind or another. I shall subsequently give the number of these latter who had either suppurative catarrh, perforation of the membrane, or intra-tympanic polypus—a very large proportion. Secondly, it shows that in more than one fourth the affection was limited to the external meatus (in the form of cerumen, abscess, polypus, or exostosis—more especially cerumen). Thirdly, it demonstrates that in between one-fifth and one-sixth of the entire number wax had accumulated in the meatus, and that naso-pharyngeal affections, such as nasal polypus, deviation of the septum, post-nasal catarrh, adenoid

growths, follicular pharyngitis, hypertrophied tonsils, more especially the three latter, were co-operating causes.

I look on this number of patients, taken consecutively and without selection from my register of study cases, as a sufficient index of the general run of aural affections we are called on to treat in private. These are some of the facts that I hope to establish in these notes; (*a*) that the broad principles of treatment are as easily, effectually, and safely carried out in the case of morbid conditions of the ear as in those of other organs; (*b*) that the most essential of those therapeutical principles, no matter how secured, are *cleanliness* (in the widest sense of the word); free *ventilation* of the aural passages; attention to the *healthy state of the naso-pharyngeal mucous membrane*; due regard to the intimate dependence of the normal auditory conditions on a healthful relation of all the delicate structures to their general and special vascular and nervous supply, and hence *to the state of the blood and the arterial and nervous systems*.

(*To be continued.*)

## ON THE USE OF ARSENIC IN MALARIAL CACHEXIA.

BY J. B. NIAS, M.B., M.R.C.P.,

*Casualty Physician to St. Bartholomew's Hospital.*

THOUGH in London we have but few opportunities of seeing ague in its acute stages, not a few persons come into our hands who have contracted the disease during a residence elsewhere, and continue to suffer from its chronic manifestations and their sequelæ. The treatment of such is often found unexpectedly tedious and embarrassing.

Such difficulty arises, I believe, first from a too exclusive reliance on quinine. Brilliantly specific in the early stages, when the paroxysm is the object of our attack, quinine has far less control over the anaemia, the visceral hypertrophies and engorgements which command our attention later on : secondly, from neglect of adjuvants to specific treatment, in the form of stomachic and cholagogue drugs, and medical bathing with massage and shampooing.

The value of arsenic in these chronic cases is, of course, referred to in all text-books, though generally very meagrely, and its use is of very ancient date. The classical work in English is that of Fowler, the author of the liquor arsenicalis that bears his name ; it is entitled *Medical Reports of the Effects of Arsenic in the Cure of Ague's Intermittent Fevers and Periodic Headaches*, by Thomas Fowler, Physician to the General Infirmary of the county of Stafford ; and is well worth reading for its lucid style and practical wisdom. Though published in 1786, it is still a compendium of treatment, and if the pamphlet were generally obtainable, there would be little need of further writing on the subject.

My first practical acquaintance with this use of arsenic was gained during a sojourn of some months in Algeria, where there is still, in spite of improvements, a considerable amount of malarial disease. First employed as a substitute for quinine on account of its cheapness, arsenic has been found by those who are compelled to sojourn in unhealthy spots to be a prophylactic equal, and often superior to, quinine. It does appear that the prophylactic effect of quinine, though admirable for those who are exposed to malaria for a comparatively short time, diminishes in time considerably, and dwellers in pestilential localities find greater immunity by the use of arsenic. How far this is due to its action as a haematinic and so forth, is open to discussion; the fact remains. The baths of Hammam R'Irha, where I spent some time, have a great reputation in the treatment of ague, and a military sanatorium is established there for this purpose; but though analysis reveals the presence of traces of arsenic in the cold ferruginous springs, the treatment there pursued depends for its efficacy on the iron in the water drunk, and on the alternation of the hot bath with cold local douches. The patient, after ten minutes in a very hot bath (about 105° Fahr.) stands in a framework of perforated pipes, from which by means of taps, fine jets of cold water play on any desired part of the body. Visceral congestions are relieved by this method in a marvellous way. It is a great pity that balneological treatment in this country should be so expensive, and as a rule so imperfectly conducted, for it is one of the causes of that excessive drugging with which Britons are reproached by continental practitioners. In Paris too, where there are frequent opportunities of seeing malarial cachexia in the persons of young men who have performed their military service in the colonies, I observe this same great reliance on haematinics and external treatment. It is agreed by most authorities that disappearance of the anaemia is promoted by reduction in the size of the spleen; everything that conduces to this end is, therefore, desirable. Hence, the benefit of drugs which relieve the portal circulation, by acting on the stomach and liver; the use of which, as I said before, is by many not sufficiently attended to. I was so strongly impressed by the importance of this, that I approached the treatment of the

following case, to which I still look back as one of my most satisfactory pieces of prescribing.

On August 29th, 1883, when I was acting for Dr. Duckworth at St. Bartholomew's Hospital, there came to the out-patient department, R.W., a tall, active, well-built young man, a commercial traveller, married and apparently steady in his habits, a native of Leeds, but who had resided for two years in the neighbourhood of New York, where he had contracted malarious fever, and whence he had returned four months previously. The first attack of fever was sixteen months before, and the paroxysm had been tertian, but had merged into a kind of irregular quotidian, from which he had never since been entirely free. He complained of weakness, shortness of breath on exertion, dull pain under the edge of the ribs on the left side ; and that he had almost every day attacks of fever with sweating, which were preceded by shivering. His temperature was normal at the time of the visit. His tongue was clean and the appetite good, the bowels open every day. Urine s.g. 1020, acid, no sugar, no albumen. He was decidedly anaemic. Physical examination showed the heart and lungs to be healthy, but the liver and spleen were both greatly enlarged, extending down to an inch above the iliac crests, and meeting together above the umbilicus, so as to render the whole epigastric region dull. He seemed much afflicted by the heavy, wearing feeling in the region of the spleen. On my making the remark that he much resembled those cases which I had seen in Algeria, and which were benefited by haematinics and hydropathy rather than by quinine, he at once replied that he was tired of quinine, having taken large quantities which had only made him feel worse. I therefore decided to give him arsenic, and to combine it with something intended to relieve the evident embarrassment of his hepatic circulation ; to which end, I prescribed liq. arsenici hydrochlorici ℥ iii three times a day before meals, in the haustus acidi nitro-hydrochlorici of the Hospital Pharmacopœia, which contains 10 mins. of dilute nitro-hydrochloric acid and spirits of chloroform with 20 of tincture of orange-peel in an ounce of water. On September 5th he returned, expressing himself as quite well, one day's use of the medicine having stopped the shivering and sweating. He was directed to continue the medicine for a week. On

September 12th he was examined afresh, the spleen had retracted two inches, the liver one inch, so that they no longer met in the middle line, but left the epigastrium resonant to percussion. He had resumed his employment, which his breathlessness had prevented him from following, on account of the necessary climbing of stairs. The medicine was repeated for a fortnight. On the 26th he was seen for the last time, and took his leave with some more medicine, and the prescription to keep by him. I have not heard of him since.

Just a week previously, on the 22nd August, there came a woman with certain anomalous symptoms, on which I had not decided. Helen W., aged 30, married and with five children, came up from Essex, living in what she described to be a malarious locality with the following symptoms. She had enjoyed good health until four years previously, when she had an attack of rheumatic fever: ever since, she had been subject to periodical attacks of pain in the right arm, shoulder, breast, and side, which lasted a few hours, being always preceded by shivering. The intervals were irregular, but had become more frequent of late, and she had found herself so much worse that she had given up her occupation of dress-making. She was anaemic, her feet slightly oedematous, and the abdomen swollen and apparently containing fluid; I regret to find no record of the size of the liver and spleen; the urine was clear, dark, and acid, containing a trace of albumen: the specific gravity not recorded. The lungs and heart were normal, the latter being carefully examined for any affection due to the rheumatic fever. The appetite was bad, tongue furred, flatulence and pain after eating. She received a saline mixture, and the diagnosis was postponed. She came the second time, just after I had seen the previously narrated case, and it struck me that this might be one of those so-called masked agues, where neuralgia takes the place of a febrile paroxysm; the anaemia sufficiently accounting for the other symptoms. She was accordingly given exactly the same prescription as R.W. I regret that the clinical clerk who saw her, did not bring her to me again next time, but I find in his handwriting on the letter that the prescription was repeated once a fortnight during the two months that the letter continued in force, without comment; so that I venture to

conclude that the treatment was satisfactory and may be taken as confirming the diagnosis.

I have, since these two cases, had a series of similar ones in hospital and dispensary practice, chiefly among discharged soldiers, or their wives, who have contracted abroad some one of those malarial fevers which go by the name of "rock fever," "Malta fever," "bilious ague," and so forth; all presenting the same main features. To all of these I have administered the same prescription, and, without exception, with benefit. I will briefly narrate, in conclusion, but one more case.

March 20th in this year came to the hospital H. S., aged 24, a labourer since his discharge from the army four months previously. He had been in India and suffered there from fever; he complained of pain in the side under the right ribs, with sickness after food and bad appetite. Physical examination showed both liver and spleen enlarged and tender to pressure, especially the liver; the other viscera healthy. He was ordered mustard poultices over the liver, and the aforesaid prescription. Four days later he reported himself much better, received some more medicine, and did not return again.

I now conclude this paper, as I began, by insisting that there comes a time in the course of ague when specific treatment becomes secondary to the appropriate treatment of symptoms; at this stage, arsenic in its treble capacity of haematinic, stomachic, and febrifuge, plays a very useful part. Of course, it is not to be vaunted to the exclusion of everything else, especially the preparations of iron, and similar tonics, nor do I claim particular efficacy for my own prescription, the excellence of which is greatly due to the fact that the nitro-hydrochloric acid which it contains is newly made at short intervals in the hospital pharmacy, which generally adds, as is greatly known, to its action on the liver. The colourless acid, as generally found in chemist's shops, is a very inert affair, and causes much disappointment to those who use it. It is much to be wished that the pharmacopoeal directions for preparation were altered to obviate this. Relief to congestion is the great point to be aimed at, and can be attained in a variety of ways, which may be left to the suggestions of individual sagacity.

## THE USE OF ANTIMONIALS IN PNEUMONIA, ETC.

BY A. D. LEITH NAPIER, M.D., ETC.

*Dunbar.*

IN further elaboration of the very interesting and practically useful paper of Dr. J. B. Nias in the *Practitioner* for August, permit me to add my testimony, formed from a somewhat extensive, almost routine, use of antimony in pneumonia, pleurisy, and febrile diseases generally, for upwards of ten years.

But, firstly, I must demur to the observation that “Antimony is not at the present date a favourite drug.” Had the assertion been made ten or fifteen years ago it would, probably, have passed unchallenged, but nowadays I fancy there are few physicians who pass a single day without prescribing antimony in some form. In support of the growing popularity of the drug within recent years, and showing the gradual recognition of its beneficial effects, I have, at random, taken four authorities on therapeutics, Garrod, Waring, Ringer, and Binz, the dates of the respective editions being 1870, 1871, 1876, and 1877. The first named writes:<sup>1</sup> “Tartar emetic is used in febrile affections to promote secretions, in severe inflammations as in acute pneumonia . . . At the present time the preparations of antimony are comparatively little used.” The author does “not remember to have prescribed them for some years, whereas, thirty years ago,” he “was in the habit of seeing them daily administered in various inflammatory diseases . . . it is possible the revulsion has been too great, and that they might be advantageously given in some forms of disease.” Waring<sup>2</sup> states, “in

<sup>1</sup> *Materia Medica and Therapeutics*, p. 956. Garrod. 2nd Ed.

<sup>2</sup> *A Manual of Practical Therapeutics*, p. 76. 3rd Ed.

pneumonia the treatment formerly in vogue of administering large and repeated doses of tartar emetic is now well-nigh abandoned." "In cases occurring in young robust subjects when febrile action is strong, and in the earliest stages of the attack, small doses (gr.  $\frac{1}{6}$ —gr.  $\frac{1}{4}$ ) act beneficially . . . It appears to have a beneficial action on the pulmonary membrane, but it exercises no specific influence on pneumonic inflammation as was formerly supposed." Dr. Waters' opinions are then quoted, these being that "larger doses (gr. i--gr. ii) may be safely given in some cases and continued for some days . . . The symptoms of the pneumonia yield during the administration, and convalescence becomes established." But Dr. Waters strikes the key-note of modern practice when he adds, "We can get all the good effects which the drug is capable of affording by using it in smaller quantities." The treatment preferred by Waters was carbonate of ammonium, chloric ether, and opium, with nutritious diet and stimulants judiciously used from an early period. Waring states further: "In the pneumonia of children antimony has been almost wholly cast aside, on account of its tendency to induce debility."

Ringer,<sup>1</sup> whose edition of 1876 is purposely selected, affirms: "Of late years antimony has been *much employed* in acute pneumonia, and the general experience of the profession is *strong in its favour*. Discretion, however, must be used in adapting the dose to the strength of the patient, who, if weak, must take alcoholic stimulants in conjunction with the tartar emetic. In many cases of pneumonia under the influence of antimony, the pain in the side gives way, the expectoration from rusty changes to bronchitic, the pulse and breathing become reduced in frequency, and the further spread of the inflammation is checked."

"Other kinds of acute inflammation may be similarly treated, although the good results are not so apparent as in pneumonia." "It is necessary to give the tartar emetic at the very beginning, otherwise its power over pneumonia is much less marked. One-quarter to one-half gr. may be given every two or three hours, or a lesser proportionate dose every hour." The many other uses of the drug are perspicuously

<sup>1</sup> *Handbook of Therapeutics*, p. 211 *et seq.* 5th Ed.

pointed out, and its administration to children is clearly indicated in Ringer's best manner.

Binz<sup>1</sup> briefly indicates its action and uses: "According to the researches of Ackermann it diminishes arterial pressure and reduces the temperature, and in large doses it destroys the irritability of the cardiac muscles." "It is employed as a symptomatic remedy in acute pneumonia and bronchitis." Dr. Sparks, the translator, refers to its value in emphysema, on the authority of Wilks; its action is to lessen the accompanying bronchial catarrh. The dose recommended by Binz in pneumonia is gr.  $\frac{1}{6}$ —gr. i.

We have thus referred to authorities, the most recent eight years old, and from these it is evident, that while the heroic dosing of thirty-five or forty years ago was relegated among the things that were, the modern system of giving smaller and more frequently repeated doses was then as now, well established. I am in complete harmony with Dr. Nias as regards the benefits of sulphate of magnesium in combination with antimony, but in my experience this combination is better borne in certain other inflammatory conditions than in pneumonia. *Magnes. sulph.* with antimon. tart. is an old and well-reputed dose in orchitis; in fact in cases of gonorrhœal inflammation of the testicle no other remedy is equal to this. Recently having had occasion to prescribe for such a case in the Militia Hospital under my charge I ordered 15m. doses of *vinum antimoniale* to be taken every two or three hours. By some error the chemist dispensed *vinum ipecac.* No other treatment was adopted beyond elevation of the scrotum. The patient whose testicle was fully the size of a large goose's egg and exceedingly tender, continued taking his medicine as ordered every two hours for twenty-four hours, and every three hours for other three days; on the fourth day the testicle was as small as its fellow and without tenderness, and the man was fit for duty. This case is the only one of orchitis I ever treated with ipecac, but the results were quite equal to many I have used tartar emetic in, and there was no sickness or loss of appetite which sometimes accompanies the use of antimony. I venture to suggest that while antimony in pneumonia should not be given so as to

<sup>1</sup> *Elements of Therapeutics*, translated from 5th German Ed. p. 237.

produce purgative or emetic effects, unless sudorific action is occasioned to some extent we have not given the drug in sufficient quantity to test its merits. The crisis of acute pneumonia is usually accompanied by diaphoresis. It is in this manner that salicylate of sodium, kairin, antipyrin, and such like drugs are of benefit in pneumonia. In cases of acute pneumonia treated wholly on the expectant principle, the same condition is observed.

In cases accompanied by extreme temperatures I have found either salicylate of sodium, quinine in full doses, or notably kairin, more rapid in promoting crisis than antimony. But after the temperature has begun to fall I believe that tartar emetic will best promote recovery, excepting always such cases of extreme vascular depression, well indicated by the rapid and fluttering pulse and irregular cardiac action, as are met with in patients of low stamina or debilitated constitution. I am accustomed to combine with antimony, squills and ipecacuan. and liq. ammon. acetat. after the stage of pulmonary engorgement has been succeeded by that of effusion. I am convinced that the rusty sputa become bronchitic much sooner by such treatment than by the exhibition of antimony alone. The following saline mixture is one I have prescribed for many years; it is sometimes given alone throughout; in some cases the "squill" mixture is exhibited alone in the latter condition of pneumonia; but most frequently equal parts of each mixture are found most suitable.

Children suffering from pneumonia seem to bear antimony equally well with adults, but the dose must be varied with regard to the individuality of the child more than in those of maturer years. I find that my "mistura scillæ-salina" with a suitable dose of hyoscyamus or belladonna is a most useful "all round" mixture in the febrile-catarrhal condition of dentition which is so often a source of worry to parents and doctors. The ingredients of the mixtures are:—

(1) Saline Mixture.	(2) Squill Mixture.
R Liq. antimon. tart.	R Vin. ipecac.
Spt. ætheris nitrosi $\text{æ}\text{æ}$ ʒiii.	Vin. antimon. $\text{æ}\text{æ}$ ʒii.
Liq. ammon. acetat. ʒii.	Syr. scillæ ʒii.
Aquam q.s. ad ʒviii.	Aquam q.s. ad ʒviii.
Ft : Mistura.	Ft Mistura.

In the slight pleuro-pneumonic illnesses met with in adults I find much benefit from the saline mixture given alone in half ounce doses every two, three, or four hours, for two or three days, after which I have usually given ʒii. of the "saline" and ʒii. of the "squill" mixture with hyoscyamus, belladonna, morphia or bromide, thrice daily.

In children who suffer from a catarrhal affection of the larynx in winter, the scillæ-salina mixture is most beneficial. In dentition I most frequently give sodium bromide with the saline mixture in ʒi. doses, to soothe the nervous irritation and allay feverishness.

Loss of appetite after a continued use of tartar emetic is by no means an invariable condition, but when it occurs lessening the dose, or stopping the medicine for a day or two, soon remedies the complaint. Quinine alone, or in combination with iron, will restore appetite impaired by small medicinal doses of antimony very speedily.

I have frequently ordered much smaller doses (gr.  $\frac{1}{20}$ — $\frac{1}{40}$ ) in very frequently repeated doses, in a similar manner to Ringer's method of using aconite for acute inflammations. I believe the best possible results may at times be obtained, but in these days of *vis naturæ* it is most difficult to speak authoritatively. The employment of antimony in other inflammations than those of the chest I will not enter on; the subject is a long one and possibly less profitable than many other subjects might be. Suffice it to say that neither in heart, brain, or abdominal inflammations can we place antimony as the first and best remedy.

I have instituted comparisons between antimony, veratrum, aconite, ipecacuanha, liq. ammon. acetat., spt. aetheris nitrosi (a most valuable and perhaps insufficiently used drug), salicylate of sodium, quinine, kairin, etc., in the treatment of acute sthenic pneumonia, and *cæteris paribus*, were I confined to one remedy, I would unhesitatingly "plump" for the first named. In special cases each of the others (some more prominently than others), are absolutely indicated, if not indispensable, but in tartar emetic we have *the* drug for acute lung inflammation in a healthy subject.

In the specific fevers, scarlatina, measles, rubeola, infantile remittent, in typhus, typhoid, variola, etc., I have very frequently

given my "saline mixture" and that alone. In rubeola and measles the *scilla-salina*, with a dash of Richardson's liq. rosæ dulc., to beautify "the bottle," is a popular favourite with children; chlorate of potas. has been given freely in combination with the "saline mixture" in scarlatina. In diphtheria, antimony is a most risky drug to employ continuously. Its emetic action in "croup" is quite another matter.

Like the author of the paper which has evoked mine, I do little more than relate experiences; and although in so doing I have, for the sake of brevity, abstained from quoting cases, I trust these notes may, in some measure, fulfil their intended purpose.

## ON POISONS FORMED FROM FOOD, AND THEIR RELATION TO BILIOUSNESS AND DIARRHŒA.

BY T. LAUDER BRUNTON, M.D., F.R.S.

(*Continued from p. 121.*)

GAUTIER obtained from putrified proteid substances, and also from the secretions of living beings, alkaloidal bodies having a poisonous action. But the greatest impulse to the study of putrefactive poisons was given by Professor Selmi of Bologna, whose researches were unfortunately too soon brought to a close by his death. To alkaloids formed by the decomposition of proteid substances he gave the name of ptomaines, by which they are now known. It was at first supposed that these differed in their nature from organic alkaloids formed by vegetables, and various reactions were given to distinguish between them. Recent researches appear to show that this distinction can no longer be maintained, and that both animal and vegetable alkaloids are similar in their chemical constitution, and are both products of albuminous decomposition. I have already mentioned Brieger's discovery that an alkaloid peptotoxine is formed during the digestion of fibrine by artificial gastric juice. Pellicani has found a poison in the suprarenal capsule, and sometimes ptomaines may be obtained from the flesh of healthy animals. It is, therefore, probable that poisonous alkaloids are continually being formed in healthy men and animals by the decomposition of albumen in the intestinal canal during the process of digestion, or in the blood and tissues generally by the metabolism which occurs during the functional activity. A considerable portion of these alkaloids is in all probability destroyed in the body, but some are excreted in the urine and faeces, from both of which powerful poisons have been extracted.

It used to be an old saying that nature never provided a poison without providing an antidote, and the fact that the dock leaf and the nettle usually grow together is often pointed to as an illustration. In the case of poisonous alkaloids there seems to be a good deal of truth in this saying, for various poisonous alkaloids which have an antagonistic action to each other appear to be produced by albuminous decomposition. It has not yet been ascertained how far the symptoms of poisoning from decomposing fish, flesh, or sausages, or from the retention of morbid products of the organism itself, such as we see in cases of uræmia, depend upon a single poison or on a mixture of poisons. It seems, however, very probable, that in many such cases we have more poisons than one, and that the comparative absence of symptoms in some cases may be due to one poison counter-acting another. Brieger has found that two of the most important alkaloids produced by putrefaction are neurine and muscarine; and to these may be added a third substance, choline. Choline is obtained by boiling bile, brain, or yolk of egg, with baryta, and gets its name of choline from its having first been obtained by treating bile in the way just mentioned. It has for some time back been considered to be identical with neurine, but Brieger has been led by his recent researches to regard choline and neurine as two different bodies, though very closely allied in their chemical constitution. By oxidising choline, obtained either from bile or from yolk of egg, with strong nitric acid, Schmiedeberg and Harnack have prepared artificial muscarine, which is almost, though perhaps not quite, identical with that which is found naturally in a poisonous mushroom (*the Amanita muscaria*). Recently Boehm has subjected choline and muscarine to a careful examination, and while he finds that their action is somewhat the same in kind, it varies in degree; muscarine being very much stronger than choline, and having a marked action on the heart of the frog which choline lacks. Artificial muscarine differs also to a certain extent from natural muscarine, inasmuch as the artificial alkaloid possesses a paralysing action on the ends of motor nerves, somewhat resembling that of curara, while the natural muscarine, if it possesses this action at all, has it only to a slight extent. With small doses the effects of artificial and natural muscarine are almost identical, and it is only when the

dose is large that the paralysing action upon the motor nerves of the artificial muscarine becomes evident. It may be said that all three bodies—choline, neurine, and muscarine—have a similar action, but choline is much weaker than the other two. The lethal power of neurine is nearly ten times, and that of artificial muscarine fifty times, as great as that of choline. The most marked symptoms which they produce are salivation, diarrhoea and vomiting, dyspnoea, paralysis and death. They seem to stimulate the secretion of glandular organs, because along with salivation there is also a flow of tears, and the secretion of bronchial mucus is rendered abundant and fluid as is shown by the occurrence of abundant moist *râles* within the chest. The dyspnoea, however, is not entirely due to abundant secretion of bronchial mucus in the lungs, because even in frogs choline produces a peculiar alteration of the respiration and dyspnæic movements.

Muscarine and neurine produce in frogs a complete arrest of the cardiac pulsations, the heart stopping in diastole;<sup>1</sup> but this cannot be regarded as the cause of the dyspnoea, because the respiratory movements in frogs are not dependent on the circulation in the same way as they are in warm-blooded animals. In mammals<sup>2</sup> muscarine and neurine render the beats of the heart slow and weak, but do not usually arrest the cardiac pulsations, so that the heart is commonly found to be beating after death has occurred. The dyspnoea produced by muscarine has been attributed by Schmiedeberg to excitement of the respiratory centre in the medulla oblongata;<sup>3</sup> but I am inclined to think that in all probability contraction of the pulmonary vessels may have something to do with it; for one of the most marked points about the action of muscarine, neurine, and choline, is the extraordinary effect of atropine as an antidote to them. In animals poisoned by any of these three substances the subcutaneous injection of atropine stops the salivation, arrests the diarrhoea, and removes the dyspnoea. It also prevents death from these poisons, but only within certain limits: for if the dose be very great, the animals may still die. More especially is this the case with choline and artificial muscarine which

<sup>1</sup> Brieger, *Ueber Ptomaine*, pp. 26 and 34.    <sup>2</sup> Brieger, *Op. cit.*, pp. 29 and 34.

<sup>3</sup> Schmiedeberg and Koppe, *Das Muscarin*, p. 50.

paralyse the ends of the motor nerves, because the curara-like action is not counteracted by atropine, but is perhaps rather increased, atropine itself having also the power of paralysing the motor nerves when given in large doses. The effect of muscarine and neurine on the heart is also removed by atropine. It is possible that atropine removes the dyspnœa by destroying the effect of these drugs upon the heart and thus allowing the circulation to go on freely again. Yet as I have mentioned in a former paper, the injection of muscarine causes the lungs to become pale, while the subsequent administration of atropine makes them regain their normal rosy colour, and I am inclined to attribute the dyspnœa produced by muscarine, partly at least, to contraction of the pulmonary vessels, and to regard the dilatation of these vessels by atropine as one of the reasons at least why this drug removes the dyspnœa.

Although, as I have already said, we do not as yet know that ptomaines having a physiological action like atropine, are generated in the intestines or in the tissues, at the same time as muscarine, neurine, or choline, it appears quite possible that such may be the case, and that we may have symptoms occurring which are due either to the mixture of two alkaloids or to the preponderance of one or other. A case of uræmia which I saw a few days ago was strongly suggestive of poisoning by a mixture of atropine and muscarine. The secretion of urine had completely stopped, the skin, eyes, and mouth were all dry, the pupil was somewhat dilated, the pulse was beating at the rate of about 130, the mouth was held constantly open, and the breathing was laboured and gasping, but air entered abundantly into the lungs, and there was no secretion of bronchial mucus. All these are symptoms such as we find from poisoning by atropine, but in two respects the symptoms resembled those produced by muscarine, for the skin was pale instead of being scarlet as in belladonna poisoning, and when cups were applied over the region of the kidneys in order to restore if possible the renal secretion, very little blood flowed from the incisions.

I have already mentioned that Zuelzer and Sonnenschein have obtained from putrefying meat infusion, a substance having the chemical reactions and physiological effects of atropine; and some such alkaloid appears to occur frequently in poisoning by

sausages, so that in a case of sausage poisoning at Wildbad in 1793 the medical man who treated the case came to the conclusion that some one either through carelessness or design had put belladonna into the sausage.

In another case of sausage-poisoning described by Dr. Kaatzer, a family ate some smoked sausage at their mid-day meal; in half an hour afterwards they became unwell, with feelings of languor, fatigue, and drowsiness, yet with such dryness of the mouth that they were unable to sleep, and were obliged to be constantly drinking. In addition to this, the father had obstinate vomiting. Next day the dryness of the throat was so much greater they could hardly swallow, and the sight became affected. On the third day the symptoms were worse, the pupils were widely dilated, there was double vision, dryness of the mouth and of the nose, and when bread was chewed it was ejected again from the mouth as dry as when it was put in. Next day the child of twelve years old died with symptoms of œdema of the lung; and the father, though much affected, could not weep as his lacrimal secretion was paralysed. The father and mother gradually improved, but on the fourteenth day of the poisoning there was still complete paralysis of accommodation. In all of them, just as in the case of urænia which I have just mentioned, there was paleness instead of redness of the face—a symptom which I am disposed to regard as possibly indicating the presence of a muscarine-like poison, in addition to one like atropine.

In other cases of sausage-poisoning additional symptoms have been noticed, which point to the existence of a muscarine-like poison also. These are the presence of diarrhœa, alternating with constipation, and of colic. The pulse also is sometimes slow, small, and almost imperceptible—a condition which is typically that of muscarine poisoning, while in atropine poisoning the pulse is rapid from the complete paralysis of the inhibitory fibres in the vagus which the poison produces.

It is possible that instead of there being two or more poisons having a partly antagonistic action there may be only one having an action resembling atropine in some respects and muscarine in others. In some cases of poisoning by fish the symptoms have been those of poisoning by atropine, viz., dryness of the mouth, difficulty in swallowing, weight of the limbs, paralysis of the

superior and inferior recti and of the oblique muscles of the eyes, as well as ptosis and paralysis of accommodation, dilatation of the pupil and double vision. The pulse was, however, not quickened as it is in poisoning by pure atropine.<sup>1</sup> V. Anrep<sup>2</sup> states that he has isolated an alkaloid from poisonous fish, which produces similar symptoms to those just described as caused by fish itself, and Vaughan<sup>3</sup> has obtained from poisonous cheese an alkaloid which he calls tyrotoxicon which produces symptoms similar to those caused by cheese or by fish. If the alkaloid should turn out to be perfectly pure we should be obliged to regard them as having an action similar to atropine in many respects, but differing from it in respect to their action on the pulse. When we remember, however, how many vegetable alkaloids previously supposed to be pure have been recently shown to be mixed with others having a perfectly opposite action, we may still regard it as probable that the symptoms of poisoning by sausages, fish, &c., may in many cases be due to a mixture of alkaloids.

In cases of poisoning by a ptomaine having a purely atropine-like action, the treatment indicated, which has also been adopted in at least one case, is the administration of physostigma either by application to the eye, or perhaps still better, by subcutaneous injection. In cases, however, where the symptoms are of a mixed character, our knowledge of the combined effects of the poisons is insufficient at present to enable us to decide with certainty whether medication of this sort would be useful or injurious in any given case, although we may try that alkaloid as a remedy which will tend to remove the most prominent or distressing symptoms. It is evident that if an atropine-like poison is present in the body at the same time with choline, neurine, or muscarine, in sufficient quantity to antagonise them the effects of those latter poisons will hardly be observed, although they may possibly evidence their presence by producing diarrhœa alternately with constipation. But if they are present alone, they may be expected to produce salivation,

<sup>1</sup> Schreiber, *Berlin. klin. Wochenschr.* 1884, xxi. pp. 162, 183.

<sup>2</sup> V. Anrep, *Vratch.* 1885, p. 213, abstracted in *London Med. Rec.*, 1885, p. 271.

<sup>3</sup> Vaughan, *Detroit Lancet*, August 1885, p. 60.

vomiting, purging, and collapse, according to the quantity which is taken into the system.

Where the symptoms are markedly those of a muscarine-like poison, we may try atropine as a remedy; and in one case lately it seemed to me to do good. A servant girl had taken at dinner some fried liver, and ten hours afterwards she was seized with vomiting and purging, which lasted the whole night. I saw her next morning and gave her some bismuth and soda, but the vomiting continuing I gave her fifteen drops of tincture of belladonna, and there was no vomiting afterwards. Of course this single case is quite insufficient to found a treatment upon, but I think that the administration of belladonna or atropine may be worth a trial in cases of poisoning by articles of food where the symptoms are those of muscarine or some allied poison.

Four alkaloids which Brieger has isolated from cadavers, viz., neuridine, cadaverine, putrescine, and saprine, have no marked physiological action; but he has isolated from human cadavers in an advanced stage of decomposition two alkaloids having a very powerful physiological action. One of these, when injected into guinea-pigs or rabbits, appeared to affect the intestine alone, and to have no action on any of the other organs. It caused an enormous increase in the peristaltic action, which lasted for several days, and the continuous diarrhoea led to extreme weakness of the animals.

Another alkaloid, which he terms mydaleïn, has a still more marked physiological action, and one which is of great clinical interest, inasmuch as we find amongst the symptoms a rise of temperature. No one who has watched cases of acute disease, such as pneumonia, can have failed to see how a rise of temperature sometimes coincides with the occurrence of constipation, and is removed by opening the bowels. In the case of such an acute disease as pneumonia, one has hitherto been unable to say definitely why constipation should produce this rise of temperature, but it seems not improbable that it may be due to the absorption from the intestine of some ptomaine. In his work on *Purgative Medicines* also, Hamilton says that in cases of typhus fever the administration of an antimonial remedy "was beneficial only when it moved the belly. In this case the faeces were black and foetid, and generally copious. On the discharge of

these, the low delirium, tremor, floccitatio and subsultus tendinum which had prevailed were abated ; the tongue, which had been dry and furred, became moist and cleaner ; and a feeble creeping pulse acquired a firmer beat."

The action of mydaleïn is according to Brieger perfectly specific in its nature. When a very minute quantity of it is injected into guinea-pigs or rabbits the under-lip in a short time becomes moist, the nasal secretion becomes more abundant, and a copious secretion of tears occurs. The pupils then become dilated, the vessels of the ear become much injected and the rectal temperature rises from  $1^{\circ}$ — $2^{\circ}$  C. The pupils gradually dilate to the maximum and cease to react to light. The coat of the animals becomes staring and sometimes they tremble ; gradually the secretion of saliva diminishes, the respiration and pulse, which at first were very rapid, become slower, the temperature falls, the ears become paler and the animals recover. During the action of the poison the animals show a tendency to sleep, and the peristaltic action of the intestine is increased. When larger doses are injected into guinea-pigs, even although they are still under half a centigramme ( $\frac{3}{40}$  of a grain), their action is exceedingly violent and always fatal. The secretion of all organs composed of involuntary muscular fibre becomes exceedingly profuse ; and the saliva becoming mixed with the intestinal discharges, the animals constantly lie in a puddle, especially as the power of motion is impaired ; exophthalmus occurs and the dilated pupils are difficult to examine on account of the profuse lacrimal secretion. When the action of the poison has attained its maximum the animals fall down, first the hind legs and then the fore legs becoming paralysed ; fibrillary twitchings are visible in various groups of muscles, and the respiration becomes more and more violent and gasping. Sometimes the animal makes a sudden upward spring, raising its head and gasping for air ; then it sinks down again and lies in its excrement, making slight defensive movements with its legs. The temperature gradually sinks, the movements become slighter and slighter, and finally the animal dies. On post-mortem examination the heart is found standing still in diastole and the bladder and intestine are contracted, but there is nothing else abnormal. In cats mydaleïn caused dilatation of the pupil ; profuse secretion of

tears, saliva, and sweat, vomiting and diarrhoea: to these succeeded paralysis first affecting the hind-legs and then the fore-legs occasionally convulsive twitchings, laboured breathing, coma and death. On post-mortem examination the heart was found standing still in diastole, the intestines contained a little thin fluid secretion, and the mucous membrane was injected. This alkaloid is, as I have already said, very interesting from the rise of temperature which it produces; but we do not as a rule find all the symptoms here described as characteristic of poisoning in animals occurring usually in men, either in cases of disease or in consequence of poisoning by decomposing food, although a number of them may occur. It is possible that the occurrence of some and not of others may be due to the occurrence in disease of alkaloids allied to mydalein, although not identical with it; or to the presence of two or more alkaloids which partially neutralise each other's effects.

(*To be continued.*)

## Reviews.

A *Text-Book of Pharmacology, Therapeutics, and Materia Medica*.  
By T. LAUDER BRUNTON, M.D., D.Sc., F.R.S., etc., etc.  
Adapted to the United States Pharmacopœia, by FRANCIS  
H. WILLIAMS, M.D. Boston, Mass. 8vo, pp. 1139, with  
188 illustrations. London : Macmillan and Co. 1885.

READERS of the *Practitioner* will not expect us to give more than a descriptive notice of this work, and indeed the numerous and careful criticisms which have already appeared in the scientific journals of this and other countries relieve us of the task of hazarding a judgment upon it. The generous tone of welcome which has marked these notices will make the author feel that his long and minute labour has not failed of recognition.

As is stated in the preface, fifteen years ago a complete work on *Materia Medica*, considerably larger than the present one, was prepared for the press. On revising it, so many uncertainties appeared regarding the mode of action of drugs, which as it seemed might be decided by a few experiments, that the printing of the work was delayed with this in view. The labour grew as it went on, and experience showed that the plan of the work might advantageously be altered; so in the end the writing was undertaken afresh, and the old manuscript thrown aside.

In the book as it stands the subject is introduced by a section, over 400 pages long, on General Pharmacology and Therapeutics. This describes with all necessary detail the methods by which the action of drugs is determined, the manner in which each function of the body can be modified by drugs, and the general *rationale* of the use of drugs in disease. And as the facts of physiology, especially those of newer discovery, are not always clearly present to the mind either of the student or of the practitioner of therapeutics, an account, brief but sufficient, of the normal functions of the different organs and systems precedes the account of the modes in which each is altered by drugs. This feature, though it contributes something to make the book bulky, is one which has already been widely appreciated,

and commends itself in the interest of clearness and precision. Strict logic would perhaps require an almost equally explicit account of the pathology of the several parts as a basis for the corresponding therapeutics: to some extent this is furnished, and in the cases where it is most fully done the text gains sensibly in completeness and coherence. The difficulty of keeping the book within reasonable limits, of preventing it expanding into an encyclopaedia of the practice of physic, has plainly had much to do with what may seem inequalities in this particular.

The thoroughness with which the General Pharmacology is treated may be illustrated by a short statement of some of the headings. After treating of the chemical relations of drugs, with suggestive references to points like the connexion between physiological action and atomic weight, spectroscopic character, and isomorphism, we have brief and pointed discussions of the effect of dose, mode of administration, cumulative action, fasting, habit, temperature, season, and the like, on drug-action. The use of experiments, the danger of erroneous deduction from them, the objections urged against them, are next reviewed. The action of drugs on protoplasm, on blood, on organisms such as the amoeba and infusoria, and on ferments unorganised and organised, leads up to a full account of the interaction of bacteria and their surroundings, and to the consideration of the true value of antiseptics, disinfectants, etc. Our knowledge of the action of drugs on invertebrates, from the medusæ upwards, is touched on; and then we have a series of minute and comprehensive monographs on the pharmacology of muscle, nerve, spinal cord, brain, sense-organs, respiration, circulation, digestion, excretion, and generation, which constitute the freshest and most instructive part of the whole volume. Diagrams, original and in some cases daring, are freely introduced, and serve in many cases not only to illustrate but to fix in the mind the doctrine enforced. Numerous tables of various kinds are also given, and distinctive type brings into prominence the essential words of each paragraph, making this section particularly easy of reference.

The second section is on General Pharmacy, and considers the drugs in common use classed according to their officinal form and mode of preparation. These paragraphs are not intended to be transferred to the memory of the student, and in the preface the author feelingly protests on behalf of learners against the harsh demands of examining boards in this respect.

The remaining sections consider each article of the *Materia Medica* in detail, inorganic, organic, and vegetable. The preparation, characters, impurities, tests, doses, and uses not only of the *Pharmacopœial* but also of the non-official drugs are given; and at every turn back-references to the earlier pharma-

ecological and therapeutical chapters, and hints of a practical or suggestive kind, illumine what has frequently been made a dry and barren enumeration. The remark made in introducing the *Organic Materia Medica* is of interest: "This Section contains Organic Compounds artificially prepared, and not merely extracted from vegetable substances containing them. Although it is small, it contains some of the most important remedies we possess, and by and by will probably replace to a great extent, and perhaps entirely, the vegetable *materia medica*." The section refers to such bodies as alcohol, chloral, iodoform, salicylic acid, antipyrin, etc.

From our description it will be plain that a main purpose of Dr. Brunton's work is not only to inform the student who reads it continuously of the present state of our knowledge of drugs and their use, but also to be a full and trustworthy reference-book for the practitioner and the physiologist. For this end nothing is so essential as good indexes, and here we have no less than three. First comes a general index of great fulness, then an index of diseases and remedies, such as has been found of great use in Dr. Ringer's *Handbook*, and lastly a bibliographical index of authorities arranged under the substances they have discussed or experimented on. This last is plainly a work of very great toilsomeness, and it fitly closes a work which should do much to enable those who use drugs to give a reason for the faith that is in them, and to cite chapter and verse for the grounds of their belief. Scepticism as to the value of "drug-treatment" is much more frequently the offspring of ignorance than of full knowledge or wide experience. Dr. Brunton has endeavoured to garner all that the past, both of clinical observation and of experiment, has taught us; but, if we are not mistaken, his book will also be memorable for the views of the future promise of therapeutics he opens out before our eyes.

*An Atlas of Practical Elementary Biology.* By G. B. HOWES.  
4to, pp. 116. London: Macmillan. 1885.

MR. HOWES has published this handsome series of drawings by way of supplying a want felt by medical students working through Huxley and Martin's *Course of Elementary Biology*. They are such as a careful teacher or an exceptionally skilful student might prepare from the actual dissections made in the laboratory. Regarded in the light of graphic notes of things seen or to be seen, or of patterns according to which actual dissections should be conducted, they will undoubtedly have a high educational value. The danger is that students may fall into the grievous error of supposing that any real knowledge of the types of life can be acquired by a study of such pictures and diagrams, without the incessant preparation, observation, and comparison

of the structures themselves: that they may think the atlas makes the laboratory unnecessary. Professor Huxley, in his brief preface, seems to foresee, while he deprecates, this danger.

Many of the lithographs are very beautiful, while all are clear, and, so far as we have tested them, minutely accurate. A useful bibliography, put as it were in the student's way if haply he can be induced to study the facts in the original authorities, and an Appendix of useful hints as to methods of work, complete the book.

*Legislation on Insanity. A Collection of all the Lunacy Laws of the States and Territories of the United States, to the year 1883 inclusive; also the Laws of England on Insanity, Legislation in Canada on Private Houses, and Important Portions of Lunacy Laws of Germany, France, &c. By GEORGE L. HARRISON, LL.D. Philadelphia. 1884.*

DR. HARRISON has produced a careful and elaborate compilation of the lunacy laws of the states and territories of the United States and has afforded opportunities for comparing these with the lunacy laws of Canada and of several European countries. This work, although certainly not light or interesting reading, and although necessarily involving much repetition, must prove of great service to lunacy specialists, and will sensibly affect the progress of lunacy legislation. It appears opportunely at a time when a thorough revision of the lunacy laws in this country is imminent, and is indeed imperatively demanded, not more for the safety of the public than for the protection of medical men, who are, it would appear, now liable to vexatious and even ruinous proceedings for the faithful discharge of their professional duty.

In glancing over the lunacy laws of the States of the Union, we are struck by the fact that some of them are considerably in advance of the corresponding body of law in this country, in that they clearly recognise insanity as a disease or group of diseases, and afford facilities for prompt and varied treatment. In the laws of each State there is something specially to commend and something specially to find fault with, and out of the whole of them a judicious eclecticism might produce a really valuable code, dealing with the safe custody of the insane and the government of lunatic asylums. The danger of Dr. Harrison's portly volume is that it tends to create a somewhat fictitious estimate of the importance of law-making in relation to insanity. The scrupulous minuteness with which, in some instances, every detail of management is prescribed suggests the propriety of being equally thorough-going throughout, whereas what is really required is simplification, with greater freedom of action. Laws, with all their hardness and rigidity, are very

brittle affairs after all. "A breath unmakes them as a breath has made." And the treatment of the insane, in every state and country, must always depend far more on the level at which science and humanity stand, than on legal injunctions and prohibitions. The insane have been well treated under bad laws and badly treated under good ones, and the effort should everywhere be to make the law efficient as an instrument of police and unintrusive in other respects.

*Diseases of the Tongue.* By HENRY T. BUTLIN, F.R.C.S., St. Bartholomew's Hospital. Fep. 8vo, pp. 451, with chromolithographs and engravings. London : Cassell and Co. 1885.

MESSRS. CASSELL are evidently resolved to make their *blue* series of "Clinical Manuals" as excellent as their already well-known and highly-appreciated *red* series of "Manuals for Students." The new series is to consist of "original, concise, and complete monographs on all the principal subjects of Medicine and Surgery," and is designed to "keep the practitioner abreast with the rapid advances at present being made in medical knowledge." Mr. Treves' *Intestinal Obstruction* was the first of the monographs which we noticed, and in the present one Mr. Butlin has raised the standard of excellence higher still. That the "unruly member" should itself afford matter for so much discussion may at first sight be a surprise; but Mr. Butlin's method is so thorough, and his clinical material so ample, that the surprise soon changes to abiding interest. The collection of coloured drawings of tongue-disease, numbering some twenty-four, is probably unrivalled. A fairly successful attempt has been made to represent in these drawings the living appearance of the morbid changes, and if it may be objected that the tints are rather pronounced, we are inclined to set this down to the colour-printer rather than to the artist. We recommend the book warmly to the notice of young practitioners, and for two reasons: the vivid pictures and descriptions will make easier and surer their recognition of the various maladies of the tongue, whether grave or trivial, and the detailed and well-weighed account given of the various operations and other methods of treatment will put at their command the digested experience of the best surgeons.

## Clinic of the Month.

**Concentrated Solutions of Saline Cathartics in Dropsy.**—Dr. Matthew Hay, in the *London Lancet* for April 21, 1883, proposed a novel method for the treatment of certain cases of dropsy, based on the administration of concentrated solutions of saline cathartics.

He there cites a case of cardiac dropsy where the patient seemed to be in the last extremity from suffering and prostration, dyspnoea, ascites, and general anasarca. "An abundance of soft râles all over the chest indicated a pronounced œdema of the lungs. He had taken every variety of renal and cardiac stimulants, and had been purged repeatedly." Dr. Hay ordered that he should have as little as possible of food and liquids during the night in order to free the alimentary canal from digestive juices and other fluids and permit the full action of the salt. The next morning three ounces of sulphate of magnesium were administered dissolved in two tablespoonfuls of hot water, no water to be given afterward.

The result was most gratifying. In less than an hour after the purgative had been given, its cathartic effect was manifested and there were repeated evacuations in the next few hours; on each occasion the water seemed to "gush" from him, and he passed unusually large quantities of urine. There evidently had not been merely a removal of so much fluid from the blood and tissues as was necessary for the usual dilution of the salt within the intestines, but the sharp, sudden withdrawal of fluid from the tissues by the concentrated blood had initiated a movement of the fluid into the latter which had continued for some hours after the direct action of the salt and the blood had ceased and until the tissues were in great part rid of their superfluous liquid. The improvement was, in fact, most marked, and continued under an occasional repetition of the concentrated saline solution. The conditions of the treatment, then, are previous abstinence from food and drinks and the administration of the salt (which should preferably be Epsom, on account of its great solubility) in a large dose in the smallest possible quantity of water.

Dr. W. G. Eggleston has reported in the *Journal of the American Medical Association*, March 28, 1885, the details of a case occurring in his own practice where the method of Dr. Hay was carried out with equally good results. The patient was suffering from a large pleuritic effusion, with prostration and gradually increasing dyspnœa. Tapping was indicated and advised, but declined by the patient. He was then ordered to abstain from water and liquid food and to take, the next morning, sulphate of magnesium, three ounces in less than half a tumblerful of water. The salt operated in less than an hour, and during the day there were eight large watery evacuations. As the patient expressed it, the water literally poured from him. There was a marked decrease in the effusion. Another dose of the salt, three ounces, was ordered to be taken the next morning, and when seen the day following the fluid was still further diminished; this effect was now followed up by twenty drops of fluid extract of jaborandi, which produced copious perspiration. In three days more the fluid had almost entirely disappeared from the chest, the lung had resumed its functions, and there was no dyspnœa. When last seen, several months after, there had been no return of the fluid. This new method of giving saline cathartics in drop-syries merits further trials by the profession. (*Boston Med. and Surg. Journal.*)

**Permanganate of Potassium in Insanity associated with Amenorrhœa.**—In the *Brit. Med. Journal*, April 1885, p. 778, Dr. P. M. Deas contributes a paper on the effect of permanganate of potassium on the uterine function. The author states that he chiefly employed this drug in obstinate cases of amenorrhœa, associated with mental derangement, and cites the following case. A young woman had been nursing a sick relative for some time; this caused her health to break down entirely. The catamenia were suppressed, and the patient gradually fell into a state of melancholia, with stupor. When she came under the author's care the catamenia had been suppressed for about a year; her general health was much below par, she was anaemic, and suffered from constipation; her mental condition was strange, she never spoke a word, and there was almost complete abeyance of volitional power, with a tendency to the cataleptic condition. After trying general treatment for two or three months, it was decided to give a trial to permanganate of potassium; at first 1 grain was given in pill three times a day; this was increased after a time to 2 grains three times a day. After two months the catamenia appeared, and, almost simultaneously, a rapid improvement set in in her mental condition and general health. At the next period the pills were renewed for a week before, and hot hip-baths were administered.

The catainenia again appeared, and the patient made a rapid and uninterrupted recovery. The author states that he has employed this drug in similar cases, and from his experience draws the following conclusions. (1) Permanganate of potassium is a safe and useful emmenagogue, and free from the disadvantages which attend some other remedies of this class. (2) Its use may be continued for months without any bad effects, and success need not be despaired of even after many months. (3) Even when it fails as an emmenagogue, it acts beneficially as a general and nervine tonic. In making pills containing this drug, the best excipient is kaolin ointment: all saccharine ingredients should be carefully avoided, as being liable to cause decomposition, and even spontaneous combustion. In the *Journal*, April 1885, p. 876, Dr. Bampton writes that prescribers of potassium permanganate will find unguentum resinæ a convenient and suitable excipient, as kaolin is difficult to manipulate. (*London Med. Record*, June 15, 1885.)

### Cerebellar Sarcoma with Monocular Hemianopia.

—Dr. Eskridge, physician to the Jefferson Medical College Hospital of Philadelphia, gives an interesting account of the symptoms in a woman, aged thirty-two, who suffered from a cerebellar tumour. They began about a year before her death, and it will render the story clearer if we anticipate the end and say that after death a nodular tumour, the size of a large horse-chestnut, was found on the upper surface of the right lateral hemisphere of the cerebellum, in such a position as to produce pressure upon the right occipital lobe of the cerebrum. There was, at first, much headache, not accurately localised, or rather shifting in position, in December 1882; in February 1883, the right eye became very painful and lost a good deal of power of vision, and the right arm and leg grew numb. In May vomiting began, quite unconnected with the food taken; in June giddiness came on also, and the headache persisted throughout. In July she came into hospital and was carefully examined. The right arm and leg were much weaker than the left; both sides were somewhat ataxic; she could walk with great difficulty, but such attempts brought on great nausea and vomiting; the patellar reflexes were diminished, but about equal on both sides; the facial muscles were unaffected; the left pupil normal, the right slightly dilated; both reacted to light, but the left to a greater degree. The hearing in the right ear had been destroyed since childhood, in the left it was normal. Taste was abolished on the right side, normal on the left. The sight of both eyes was much affected, with the right eye fingers were counted at ten feet, with the left at six feet. The field of vision in the right eye was good, but in the left there was

hemianopia of the temporal side extending up to about the median line. There was optic neuritis in both eyes, more advanced in the right. The headache, nausea and vomiting reduced her to a state of great prostration and continued up to her death, five months later, and some symptoms of hysteria were added. On examination a tumour, such as we have described above, was found, without any other abnormality of the brain. The optic nerves were not critically examined. The case, to a certain extent, supports the conclusions of Munk, Ferrier, and others, that the cortical substance of certain portions of the occipital lobe is the centre of vision. In this case a pressure on the *right* occipital lobe is supposed to have made blind the *left* side of the retina of the *left* eye. According to Munk's conclusions, it would have been more likely that the *right* eye should have been affected. (*New York Journal of Nervous and Mental Disease*, No. 1, Vol. X.)

**Non-congenital Deaf-mutism.**—M. Boucheron points out that most cases of deaf-mutism are acquired and consecutive to disease occurring after birth in children otherwise intelligent. If once the child becomes deaf permanently, the power of speech is soon lost. Passing over the class of congenital deaf-mutes, the acquired form comes on, for the most part, as a complication of one of the acute specific fevers. M. Boucheron urges that this class is also heritable, being due to naso-pharyngeal catarrh, the tendency to this form of inflammation being acquired from the parents. It runs in families, and is more often met with among the inhabitants of mountainous districts than in those who dwell in plains; unlike the true congenital form, it is not due to race-degeneration from marriages of consanguinity but is often dependent on the inheritance of naso-pharyngeal catarrh from the parents.

Deafness comes on (1) without other signs or after infectious disease, or (2) associated with symptoms of meningitis or epileptiform convulsions. The most favourable cases are those not complicated by convulsions. The child possibly after measles or meningitic phenomena is left deaf, unable to walk or stand, but otherwise intelligent. These conditions may, if left alone, end in deaf-mutism; though they may at once subside on inflation of the eustachian tube. Inflammation spreading from the naso-pharynx causes swelling of the mucous membrane lining the eustachian tube, the air in the tympanum is absorbed and not renewed, and consequently the membrane is driven in by the atmospheric pressure. Acting through the ossicles, the weight of the atmosphere raises the pressure in the internal ear, and finally compresses the auditory nerves, producing deafness and tinnitus. Pressure on the nerves in the

semi-circular canals produces loss of equilibrium, so that the subject can often neither walk, turn round, or hold his head upright. The stimulus travels to the medulla, and gives rise by reflex action to nausea, vomiting, wryneck, ocular spasms, grinding of teeth, retraction of the abdomen, and epileptiform seizures, &c.; so that the patient's condition suggests that he is suffering from true meningitis. If these attacks of pressure are prolonged, or often repeated, some of the nerve-fibres get destroyed, and more or less permanent deafness remains. Experimentally all these symptoms may be produced in dogs by closure of the eustachian tube. Prognosis is good for children if seen early, but bad for adults according to the number of nerve-fibres destroyed. In determining the cause of the obstruction of the eustachian tube, the naso-pharynx must be examined for catarrh, adenoid growths, &c. It is of great importance to relieve the pressure on the labyrinth, before any nerve-fibres have been destroyed; for if totally destroyed in both ears, dumbness only too quickly follows the deafness. Treatment consists in: (1) Inflation of the eustachian tube; (2) attending to the condition of the naso-pharynx, and removing adenoid growths, if present; (3) galvanism to the acoustic nerves, after removal of the pressure on the labyrinth. (*Revue de Médecine*, May 1885.)

**Hysterical Paralysis without Contracture.**—Drs. P. Marie and Sonza Leite give a short summary of seven cases of hysterical paralysis without contracture in women under M. Charcot's care in 1884. The conclusions reached may be summarised briefly as follows—(1) In all the cases sensation and muscular sense are either diminished or entirely lost in the paralysed parts. (2) The tendon reflexes show no constant characteristic; in three cases they were increased, in four diminished or lost. This result contradicts the hypothesis that is sometimes put forward, viz., that all hysterical paralyses even if they have no visible contracture yet show signs of a tendency to contracture by their increased deep reflexes. (3) The hemiplegic distribution of the paralysis is the commonest type, the monoplegic the rarest; M. Charcot finds the face never affected. Seeligmüller and Buzzard, however, claim to have seen hysterical paralysis of the face. (4) The origin in four cases out of the seven was "dependent on idea" as Dr. Russell Reynolds says. One woman got herpes zoster on the left side; movement was painful at first and she gradually came to think it impossible in the left arm and leg; by sudden pressure on the eyeballs she was rendered lethargic, and the lethargy passed into a somnambulic state in which she readily assented to the suggestion that she could move both sides equally; she was put

through a series of exercises before she was awake, and when awake she found herself rid of her paralysis. Another girl, whose father was hemiplegic and who was afraid of suffering as he did, brought on herself a hysterical hemiplegia. In several cases the special senses were unilaterally affected; hearing was lost by one ear, smell by one nostril, taste on one side of the tongue, the visual field of one eye was commonly contracted, and the appreciation of colour in various ways rendered abnormal. (*Recue de Médecine*, May 1885.)

**The Bubo of Rheumatism, and the value in prognosis of Rheumatic Nodules.**—Ernest D., a boy of seventeen, was attacked for the first time in June, 1882, with acute rheumatism: the symptoms were severe; salicylates gave little relief. Endocarditis developed at the end of the first week, and afterwards serious pericarditis. He was more than a month in bed, and was eventually discharged with adherent pericardium and mitral incompetence. About the same time that the endocarditis was coming on two movable fibro-cartilaginous nodules, as big as cherry-stones, were first noticed on the flexor tendons of the middle and index fingers of each hand. These grew smaller slowly. Three weeks after his discharge he was seen again with five or six small sessile indolent nodules in the occipital region which were said to have developed in a few days. They were like syphilitic periosteal nodes, but, on careful examination, the hypothesis of syphilis was given up. Below them were many oblong indolent tumours, apparently the glands which had enlarged owing to the nodes. A tumour analogous to those on the occiput was to be felt in the trapezius muscle, another in the pectoralis. In the axillæ and groins were masses of enlarged indolent glands, hindering free movement. The palmar nodules were notably increased. Diagnosis was for a time doubtful. The blood was natural, there was no leucocythaemia; M. Verneuil gave his opinion against lymphadenoma. It was agreed finally that the tumours on the skull and in the muscles were rheumatic nodules, and the glands rheumatic buboes. Under iodine and arsenic the patient rapidly recovered, and in three weeks the nodules had disappeared and the glands had become normal. Two years later there was a second attack of acute rheumatism; a lump was noticed in the biceps which disappeared after a few days; the cardiac symptoms were very severe; and the patient was discharged completely crippled in October 1884. M. Brissaud remarks that the term he adopts—rheumatismal bubo—has been used previously for conditions in chronic rheumatism only, but he considers that it most accurately describes the symptoms of his acute case. His principal points are that the rheumatic

nodules have great value in prognosis, for they always show a rheumatic habit which is strong though it may only be potential and liable to be lighted up at any moment, and further that they accompany peri- and endo-carditis. Among previous observers, Meynet, who made the earliest observations, found the nodules in a severe case with cardiac complications; Troisier in a man who had had frequent attacks of acute rheumatism since he was seventeen, but no nodules and no heart disease till he was forty-five when they both came together; Hirschprung, in 1877, accompanying acute peri- and endo-carditis in a child who had had acute rheumatism previously. M. Brissaud thinks that Dr. Angel Money goes too far in saying that they may be found in as many as half the cases of acute rheumatism in children; but he admits that when they appear in adults they show that the disease is of the juvenile type, prone to recurrence and cardiac lesions. Their pathology is essentially analogous to that of the heart diseases they accompany, without which rheumatism would be a pyrexia *sine materia*; for rheumatism, as M. Lasègue says, touches pleurae, meninges, and synovial membranes with its tongue, but the heart with its teeth. (*Revue de Médecine*, April 1885.)

**Influence of Sea-voyaging on the Genital Functions in Women.**—At a recent meeting of the Medical Society of the County of New York, Dr. J. A. Irwin read a paper on this subject, based principally upon observation during several years that he had acted as a ship-surgeon. During his service at sea not fewer than 15,000 persons had come under his care. Among this number of passengers there were 104 pregnancies, 11 parturitions, 3 miscarriages, and 451 menstruations or missed periods in women among whom the function was usually normal. Of the 451 observations upon the menstrual periods of women at sea, 288 were made under his instructions by a stewardess, and, being replies received to formal questions, he thought they could be relied upon as accurate. All of the 288 women were supposed not to be pregnant; menstruation was normal previously to the voyage in all; 21 of them passed the period while on board without menstruating; 43 menstruated before the period; 224 menstruated at the proper period; 23 complained of unusual pain, and in a few instances there was increased or diminished flow, while 201 of the women noticed absolutely nothing unusual which could be attributed to the voyage. Of Dr. Irwin's own 163 observations among women of a higher social standing, 13 passed the period on board without menstruating, of whom 11 experienced more or less malmen; 51 menstruated before the period, and 99 at the period. Of these, 47 complained of unusual discomfort, accompanied in 37

cases with increased and prolonged flow, and in two with diminished discharge. Of the 13 who passed the period, 3 were still on board at the following period; one of the three then menstruated almost normally, in one the result was not known, and in the other the flow was increased in quantity and prolonged in duration; but she subsequently experienced complete amenorrhœa during two periods. Dr. Irwin thought it was evident there was during a sea-voyage a tendency to increased pelvic congestion, which would offer an explanation for the phenomena usually observed regarding the menstrual function. As to the special conditions in an ocean voyage which might be supposed to exercise an influence upon the female habit, they might be classed under three heads; psychical influences, dependent upon the novelty of the situation and the apprehension of danger; second, aërial, consisting in some special quality of sea-atmosphere; and third, motional, as a direct result of the movement of the vessel. With regard to periodicity, the most constant change was a premature return of the flow, and this return might take place at any time during the intermenstrual epoch. If a woman went on a voyage shortly after the cessation of the flow, there would be liability to a renewal of the discharge or of the peculiar symptoms attending a period, and it might lead to suppressed menstruation at the next time it should come on. Complete and passive amenorrhœa for one or more periods was a frequent after-result of the transatlantic voyage. Of the effects of a sea-voyage upon menstruation, none was more constant or unfortunate than an aggravation of whatever discomfort was ordinarily associated with that process. An ocean-voyage should be regarded as a potent emmenagogue, having a well-marked tonic, alterative, and sedative influence. But it should no longer be prescribed empirically, but with a definite object in view. There were many cases in which it would be indicated; for instance, in certain conditions of chloro-anæmia, amenorrhœa with pain, and retarded sexual maturity, certain forms of leucorrhœa and uterine hysteria, and lack of development. The influence of sea-voyaging upon gestation was important. It was the author's opinion that pregnancy, especially during the latter months, predisposed and aggravated the most distressing features of sea-sickness. (*London Medical Record*, July 1885.)

## Extracts from British and Foreign Journals.

**Indican in the Urine in Diseases of the Bones.**—Dr. Grossic, while making observations on the temperature after fractures and operations on the bones, noticed that in all such, as well as in certain bone-diseases, especially osteomyelitis, there was an appreciable increase in the excretion of indican in the urine. The more vigorous the subject, or acute the disease, the greater the amount of indican, and the earlier (second or third day) it appeared. In tuberculous and feeble subjects it was not observed until perhaps as late as the tenth day. He believes that it may have some diagnostic value, inasmuch as if there be no increase of indican, there can be no injury or disease of the bones themselves. (*Wiener med. Blätter*, No. 20, 1885.)

**Hypodermic Injection of Oil.**—In a paper read before the Section of Practical Medicine at the recent meeting of the American Medical Association, Dr. J. V. Shoemaker, of Philadelphia, said that it was well known that oils which could not be swallowed, or were rejected by the stomach, could be absorbed by injection and subcutaneous injection; but the more rapid and effective use of these agents subcutaneously had had very little practical application. Krueg used subcutaneous injection of olive oil in the case of an insane patient who refused to eat, with the result of keeping him in good bodily vigour; at the end of a month, he was induced to take food in the natural way. Dr. J. T. Whittaker, of Cincinnati, had, in a case of gastric ulcer, given subcutaneous injections of drachm-doses of milk alternated with beef-extract. The general condition of the patient was improved, but abscesses formed where the milk had been injected. Cod-liver oil was then substituted for the other articles, two drachms being given every two hours for two days; on one day eight ounces were injected. No ill effects attended or followed the injections of the oil. Dr. Shoemaker had, he said, been induced a few years ago, in consequence of the inability of some of his patients to bear medicine by the stomach, to try subcutaneous injection of oil; and the effects in various diseases had been highly gratifying. Castor-oil ad-

ministered in this way had acted as a laxative in many cases of constipation. For this purpose, one or two injections of a drachm or two of the oil were generally sufficient. Injection of a like quantity of cod-liver oil or olive-oil had been attended with improvement of nutrition in cases of debility, dyspepsia, scrofula, tuberculosis, and some diseases of the skin and nervous system; it was especially useful in diseases of the alimentary canal, and in all affections depending on defective nutrition. The injecting syringe should have a capacity of from four to eight drachms, and should be provided with a needle of good calibre. The injection should be made in parts well provided with sub-cutaneous areolar tissue, such as the superior and inferior scapular and the sacral regions, the arms, the chest, the buttocks, and legs. Some irritation was produced at the point of puncture, sometimes redness and swelling; but these soon disappeared. There was no induration or inflammation, if proper care were taken in using the syringe and the tissues were in a healthy condition. (*Brit. Med. Journal*, June 20, 1885.)

**Peroxide of Hydrogen in Purulent Otitis.**—Dr. William A. Dayton says, relative to the use of peroxide of hydrogen in suppuration of the ear:—A spray of a four per cent. solution of the peroxide has had an almost magical effect in a case of ozæna complicated with “proliferous” catarrh of the middle ears. It will be observed that the stronger solutions induce local anaesthesia often in a marked degree. This is certainly advantageous, not only in the event of operative interference, but also in doing rhinoscopic work; besides, I have noticed that cocaine acted more promptly after the mucous membrane had been cleansed with the peroxide.

“The above is but a hint at the various applications of this agent, should it meet the expectations of interested workers. Even though no curative results are obtained in the experience of others from the peroxide *per se*, it *will* be found to be a most marvellous cleanser; and, if cleanliness is the desideratum in middle-ear suppuration, then we have a servant *par excellence* in the peroxide of hydrogen.” (*Archives of Otology*, March 1885.)

**Chloral in the Treatment of Chorea.**—M. Joffroy, in a clinical lecture upon chorea given at the Hôpital des Enfants Malades, Paris, advocates the prescription of chloral in this disease. He stated that in 1879 he administered the drug in two very severe cases in gramme doses every quarter of an hour until sleep was procured, the same dose being repeated whenever the child awoke. In that way he procured for the patient a continuous sleep broken only twice in the twenty-four hours for the taking of food. The chloral was omitted in the one case at the end of four days, in the other at the end of five days, “not

daring to prolong this deep and continuous sleep any longer." Marked improvement followed this somewhat heroic measure. His usual practice is to give chloral three times a day, and to continue it for a fortnight, a month, six weeks, or two months, according to circumstances—indeed, until a cure is effected. He has had no ill results from this treatment, and only occasionally has he observed a fugacious roseola or erythema, which lasted for twenty-four hours, and disappeared without discontinuing the drug. The object of this treatment is to procure as much sleep as possible, and the dose is of course proportioned to the age of the patient. Above the age of ten the daily dose is four grammes (i.e. sixty grains) taken after meals, one gramme in the morning, one at midday, and two in the evening. Between the ages of six and eight the total amount must not exceed three grammes daily, and the quantity administered must be graduated so that the largest (evening) dose should produce sleep within a quarter of an hour; and, as stated, it is continued until the choreic symptoms have disappeared. By this method he claims not only to prevent the serious complications that arise in the severer cases, but to appreciably diminish the duration of the affection. Curative as M. Joffroy believes chloral to be in its action, there are, he admits, some cases which resist its influence. These are severe and violent cases, and for them he employs the wet pack in addition to the sedative drug. The body being enwrapped in cloths soaked in cold water, vigorous rubbing is employed from head to foot; and when, after one or two minutes, reaction sets in, the patient, still enclosed in the pack, is completely enveloped in wool and left there for half an hour. This measure is always followed by a period of repose, the child generally passing into a deep sleep, on awaking from which the choreic movements are much diminished. The same treatment is applicable to all cases. (*Lancet*, July 11, 1885.)

**Diagnosis between Indurated Chancre and Herpes.**—It sometimes happens that herpes of the penis presents itself under the form of a single patch of superficial ulceration, accompanied by some induration of the underlying tissues: there may be also a swelling of the inguinal glands, so that the diagnosis between this so-called chancreiform herpes and some forms of indurated chancre is very difficult in the early stages. M. Leloir, however, calls attention (*Journ. de Connaiss. Méd.* April 2, 1885) to the fact that when a herpetic ulcer is pressed between the fingers, a drop of serous fluid is squeezed out. This manipulation can be repeated several times with the same effect: in the case of chancre, on the contrary, a little fluid is seen on the surface, but the quantity is not increased by pressure. When the base of the herpetic ulcer is indurated, the hardened tissues can be

flattened between the fingers, while, in chancre, no amount of pressure can change the shape of the nodule. This difference is explained by the fact that in herpes there is a localised oedema of the tissues, while in chancre the chief lesion is a hard infiltration, sometimes accompanied by sclerosis of the connective tissue and of the vessels. (*British Med. Journal*, July 18, 1885.)

**Hot-weather Hygiene.**—A paragraph in Mr. Stanley's recent work on the Congo contains such good advice for those travelling in hot climates that we venture to repeat it. It will be seen that the suggestions are not entirely without application to our own latitude during the excessive heat of midsummer. Under such circumstances, the diet, clothing, and habits need to be placed upon a hot-weather basis, and, with such an adjustment of the economy to the environment, the hot weather may really be made less prolific of disorder than the cold. The advice has been to some extent anticipated and its value shown by experience in the management of young children during the summer. Mr. Stanley says : "From the moment of arrival the body undergoes a new experience, and a wise man will begin to govern his appetite and his conduct accordingly. The head that was covered with a prond luxuriance of flowing locks, or bristled bushy and thick, must be shorn close ; the body must be divested of that wind- and rain-proof armour of linen and wool in which it was accustomed to be encased in high latitudes, and must assume, if ease and pleasure are preferable to discomfort, garments of soft, loose, light flannels. That head-covering which London and Paris patronise must give place to the helmet and puggaree, or to a well-ventilated light cap with curtain. And as those decorous externals of Europe, with their sombre colouring and cumbrous thickness, must yield to the more graceful and airy flannel of the tropics, so the appetite, the extravagant power of digestion, the seemingly uncontrollable and ever-famished lust for animal food and the distempered greed for ardent drinks, must be governed by an absolutely new *régime*. Any liquid that is exciting, or, as others may choose to term it, exhilarating or inspiring, the unseasoned European must avoid during daylight, whether it be in the guise of the commonly believed innocuous lager, mild Pilsen, watery claret, *vin ordinaire*, or any other 'innocent' wine or beer. Otherwise the slightest indiscretion, the least unusual effort or spasmodic industry, may in one short hour prove fatal. It is my duty not to pander to a depraved taste nor to be too nice in offending it. I am compelled to speak strongly by our losses, by my own grief in remembering the young, the strong, and the brave who have slain themselves through their own ignorance." (*Philadelphia Med. Times*, July 11, 1885.)

**Galvano-cautery in Ophthalmic Surgery.**—M. Nieden considers that the employment of the galvano-cautery is especially adapted to the treatment of affections of the conjunctiva and of the cornea proceeding from some mycotic infection, such as trachoma, sclerosis of the conjunctiva, rodent ulcer of the cornea, and marginal ulcer of the cornea of a scrofulous nature. In these cases galvano-cautery effects thorough disinfection, the base of the ulcer becoming perfectly clean, and the process of reparation proceeding steadily, as is proved by the aqueous humour becoming clear, hypopyon disappearing, and the iris dilating. In many instances it renders keratotomy unnecessary, and if it still appears to be requisite the incandescent loop is capable of effecting the opening of the anterior chamber through the base of the ulcer. The operation gives little pain, can be performed without any anaesthetic, without the introduction of a speculum and even without assistance. M. Nieden gives the result of 100 cases, the majority of which were ulcers of the cornea. In some instances the cautery had to be applied from three to six times before the process was arrested. Ciliary neuralgia rapidly disappeared and a cure was effected in a shorter time and with less deformity than, in his opinion, by any other method. (*Recueil d'Ophthalmologie*, No. 1, 1885.)

**Boroglycerine in Ophthalmic Practice.**—Webster Fox of Philadelphia presented to the Ophthalmological Congress held in Copenhagen last year, specimens of boroglycerine. This is an amber-coloured substance with vitreous fracture, insoluble in alcohol and in water. It is astringent and antiseptic, and promises to be of special service in catarrhal affections of the eye. It is prepared by heating sixty-two parts of boric acid and ninety-two parts of glycerine until the mixture ceases to lose weight, which occurs when it has become reduced one third. Dr. Fox recommends its employment in ulcers of cornea, in which affections it can be applied mingled with eserine; in the palpebral granulation of young subjects complicated with pannus, that is in the advanced stages of trachomatous keratitis, when it may be mingled with atropine sulphate, or copper sulphate; in cases of marginal blepharitis and eczema of the lids, where it may advantageously be used in solution of glycerine. He has also found it serviceable in the ophthalmia of new-born children, a small quantity being introduced in solution every two hours. (*Recueil d'Ophthalmologie*, No. 1, 1885.)

**Chloroma.**—Dr. F. G. Gade, of Christiana, has had a case of the rare disease called chloroma, chlorosarcoma, green cancer, and periosteal and metastatic sarcoma, which was first described by Balfour in 1834, and of which ten cases have already been

recorded. Gade's case was in a little girl aged 5, who first suffered from anaemic symptoms, and then from a tumour of the left cheek, with toothache, tinnitus aurium, otorrhœa, deafness, and continually increasing exophthalmos. Nine weeks after these symptoms appeared, she died with pyrexia and great prostration, without having exhibited any phenomena of cerebral mischief. At the post-mortem examination, an immense number of greenish-yellow and greenish-grey fibrous tumours of sarcomatous structure were found in various situations, but more especially connected with the periosteum. They were found on the dura mater, in the internal ear, in the orbit, in the periosteum of the skull and facial bones, in large numbers on the sternum, on the ribs and vertebral column, also in the liver, kidneys, colon, lateral ligaments, and the medulla of the bones; also on the lower extremities there were a number of livid spots, the largest of which contained a butter-like substance. The case is very similar to those previously recorded, which were all in children. The green colouring matter, which can be dissolved out by maceration in chloroform as a dark green oily liquid, is not related, according to Gade, agreeing with Otto, either to the blood or to the biliary-colouring matter, but is formed from fat-granules, great numbers of which are found in the cells of the neoplasm. (*Brit. Medical Journal*, July 11, 1885.)

**Therapeutics of Antipyrin.**—Dr. Leon Arduin, after long experimentation, publishes the following results. Of its physiological action he says: (1) Antipyrin without doubt influences the nervous system; its action is expended upon the medulla oblongata and cerebrum. (2) Its action upon the circulation is to diminish the force of the heart-beat; animals die of paralysis of the heart. From spectroscopic examination of the blood the drug does not seem to have any special effect upon this fluid. According to Professor Demme it is a poison to the protoplasm. As to the influence of antipyrin upon arterial tension there is a great divergence of opinion; some holding that it is elevated, others that it is lowered. Q. eirolo, who has made special study of the action of the drug upon the blood-vessels of the skin, has constantly noticed that they become dilated, and by this effect it is, according to him, that antipyrin reduces temperature. (3) Antipyrin seems to have no great influence upon respiration, nevertheless it is admitted, in a general way, that the respiratory movements are diminished in frequency. (4) The action of antipyrin upon urinary secretion is, in many respects, still obscure. It is admitted, however, as demonstrated by Müller, that the urine is diminished to a very limited extent, the sulphates increased, while the urea is at the same time increased. (5) As to its haemostatic effect no explanation at

present can be given, and it must suffice simply to remark such action. (6) How does antipyrin reduce temperature? The hypothesis that this special action of the drug is produced by the evaporation of the perspiration must be discarded, and in opposition to Queirolo, who explains this effect by the action upon the general circulation, or simply by its effect upon the vessels of the skin, Dr. Arduin inclines to the opinion that the reduction of temperature is the result of a direct action of the drug upon the *thermogenic centres*, and holds that in no other way can its prompt and certain apyretic effect be explained. The therapeutic action of the drug is stated as follows: (1) In all febrile diseases—not the simple fever, but the exaggeration of the fever, *i.e.* hyperpyrexia,—varying in each patient, is the indication for the use of apyretic medication. (2) In the severer febrile diseases, such as typhoid fever, in tuberculous patients, in pulmonary phthisis, the persistence of the fever constitutes a new indication. (3) To avoid the production of excessive and exhausting perspiration, and to avoid reducing the patient to a condition of adynamia, which may result from abuse of the drug, it should be administered in small doses. Finally, in apyretic medication, only a physiological and clinical result should be sought, that is, no effort should be made to produce a normal temperature in a disease of which pyrexia is a special characteristic. The drug may be administered per rectum by injection or suppository. In the latter form it is not efficacious as an antipyretic, but of great service in some cases of hæmorrhoidal flux. The most desirable method of administration, however, is by mouth. The antipyrin should be dissolved in a little sweetened water flavoured with aqua menth. pip. or other aromatic, with which a little red wine may be advantageously incorporated. The dose is from 8 to 12 grains in phthisis; 15 to 45 grains in typhoid fever and other diseases in which great elevation of temperature is characteristic. No more than 15 grains should be given at a time and the doses should be at intervals of about one hour. (*Bulletin Général de Thérapeutique*, March 30, 1885.)

Dr. Pusinelli summarises the results of his investigations upon the therapeutic effects of antipyrin as follows: (1) Antipyrin operates in all cases, with the single exception of rheumatism, as a safe means of lowering the temperature. (2) The duration of the time through which the antipyretic effect extends, depends upon the condition of the disease and upon the size of the dose. Fifteen grains produce marked effect in severe febrile disease for a period of two or three hours; thirty grains for from four or five hours; and forty-five grains for about six hours. (3) Before the treatment with antipyrin is begun, test doses of the drug should be administered,

of a strength varying from seven and a-half to fifteen grains, in order to note the strength of individual cases. (4) In severe febrile diseases, as in typhoid fever, croupous pneumonia, erysipelas, &c., in which the temperature is very high, doses of thirty grains for men and of fifteen grains for women are indicated, and then only at intervals of an hour, and if the remedy can be endured in doses of this size. In private practice its administration every two or three hours is advisable. For complete defervescence from sixty to ninety grains daily suffice. (5) In diseases with a temperature but little above normal, and in chronic diseases, especially in phthisis with hectic fever, it is often necessary only to give a single dose of from fifteen to thirty grains, in order to obtain relief from the fever of from six to twelve hours, and even for a longer period. (6) Against the febrile manifestations of acute articular rheumatism the remedy is sometimes contra-indicated. Operation upon the joint disease was not observed. (7) In intermittent fever antipyrin is without effect; it sometimes is serviceable in cutting short the duration of the fever at its highest point at the time of its occurrence. (8) In no case of disease treated with antipyrin did it exercise a specific effect, for example, as does of quinine in intermittent fever. However, the course of typhoid fever under treatment with antipyrin is perhaps shorter and milder. In croupous pneumonia there is marked improvement of the general conditions under its use without any effect being produced upon the local process of the disease in the lungs. Further, in phthisis with severe remittent fever, freedom from fever of several days' duration, with improvement of the general symptoms, is frequently manifested. (9) Antipyrin, generally speaking, is well borne. Collapse and chills were never noticed; pulse and respiration were not unfavourably influenced, and upon the kidneys no unfavourable effect was observed. (10) Unfavourable symptoms, due to an exanthem, occasionally were manifested, as sometimes were vomiting and perspiration. The vomiting was especially noticeable in women, rarely in men. To avoid the symptoms of vomiting, administration of the drug by enemata may be resorted to; but even then the symptom sometimes is observed. The perspiration is only seldom disagreeable and harmful to the patient, and it then may be obviated by the contemporaneous administration of atropia. (11) Antipyrin has the great advantage over quinine of being easily soluble in water, and further, it is of itself capable of reducing the temperature so that for a long time a perfectly normal bodily temperature is obtained, and this quinine is unable to accomplish. (12) Antipyrin is to be preferred to kairin and hydro-chinin on account of its persistent effect upon the fever, and further, on account of the absence of

collapse and chills during its use. (*Deutsche med. Wochenschr.*; March 12, 1885; *Amer. Journ. Med. Sciences*.)

**Therapeutics of Thallin.**—Prof. Maragliano, at a meeting of the Italian Medical Society held in Genoa, April 28, 1885, reported the results of his experiments made upon thallin. He observed that in apyrexia thallin exercises a slightly depressing effect upon the temperature, and that the pulse and respiration are also slightly diminished in frequency, while the intra-arterial pressure is slightly increased. In patients in whom pyrexia is present, thallin constantly lowers the temperature, the reduction varying with the dose. Doses of about 4 grains cause a reduction of about  $1\frac{1}{5}$ ° F.; doses of  $7\frac{1}{2}$  grains a reduction of from  $1\frac{4}{5}$ ° F. to nearly 6° F.; doses of  $11\frac{1}{2}$  grains reduce the temperature from  $2\frac{1}{3}$ ° F. to  $7\frac{1}{5}$ ° F.; while doses of  $15\frac{1}{2}$  grains cause a reduction of from  $3\frac{1}{2}$ ° F. to  $8\frac{1}{2}$ ° F. The reduction of temperature ordinarily begins in an hour after the administration of the drug and attains its maximum in two hours if the diminution is about 2°·7 F., and after three or four hours if it is greater. The effect of the drug persists from one to ten hours according to the dose. The reduction of temperature is ordinarily accompanied by perspiration, more or less profuse. The disappearance of the fever is sometimes preceded by shivering and chill. Frequency of the pulse and of respiration diminishes proportionately to the reduction of temperature and to the dose of the drug. Thallin does not produce vomiting nor any other gastric disturbance, and may be administered in the quantity of 110 grains in twenty-four hours without inconvenience of any kind. It is found in the urine an hour and a-half after its administration, and the greater quantity of it is eliminated in the first ten hours. Twenty hours after the administration of the drug the urine does not give the characteristic reaction with the perchloride of iron. After the administration of the drug the urine assumes a characteristic darkish-green colour, which sometimes is absent after small doses. Prof. Maragliano has administered thallin in divers febrile diseases, and finds the fever depending upon pulmonary phthisis to be the least resisting, while that of fibrinous pneumonia is the most intractable. Prof. Maragliano also finds that the drug diminishes the quantity of urea and of carbonic acid eliminated in twenty-four hours in apyretic subjects, and that it causes in the apyretic, as well as in patients with elevated temperature, a dilatation in the cutaneous vessels and an increase in the elimination of heat. (*Gazzetta degli Ospitali*, May 20, 1885.)

**Cocaine in Venereal and Syphilitic Disorders.**—The experience of Bono with cocaine in affections of the genital

system may be conveniently epitomised as follows: (1) An injection of a few drops of a two per cent. solution of cocaine removes promptly the pains felt in acute gonorrhœa during micturition and erection. The injection has to remain in the urethra for at least five minutes, and to be repeated four to five times daily. (2) This cocaine injection is unrivalled in rendering caustic injections or the introduction of the catheter painless. (3) The burning pains of blennorrhœa in women yield invariably to small cotton tampons saturated with a two per cent. solution of cocaine, or to the application of a five per cent. cocaine ointment. (4) Cocaine facilitates the examination of urethra and bladder with the bougie and the endoscope. (5) It allows of a painless cauterisation in balano-prostatitis. (6) Pointed condylomata can be painlessly cauterised, excised, or scraped out with its aid. (7) In cauterisation and excision of primary syphilitic affections, cocaine evinced very desirable analgesic virtues of a sufficiently long duration. (8) Taken internally during an antisyphilitic treatment, cocaine did not present any appreciable effects. (9) Its local effects are highly beneficial in syphilitic tonsillitis and in stomatitis mercurialis, and difficulties of deglutition. (*Therapeutic Gazette*, June 15, 1885.)

**The Treatment of Hæmorrhoids by Injection.**—In an instructive clinical paper, Dr. Charles B. Kelsey, of New York, urges the treatment of hæmorrhoids by injection of carbolic acid. After an ample experience this has become his routine practice, and in all his cases he has never known a patient to abandon the treatment after it was begun, and he has never failed to effect a perfectly satisfactory cure by it, and he has never had an accident of serious nature with it. He uses three solutions, one of 15 per cent., one of 33 per cent., one of 50 per cent., and sometimes he uses the pure acid. In a severe case he begins with the stronger ones, in a mild case with the weaker. (*American Journal of the Medical Sciences*, July 1885.)

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## Department of Public Health.

### THE RESULTS OF THE NOTIFICATION OF INFECTIOUS DISEASES.

(Continued from p. 151.)

*Reading* (Berkshire).—Population 42,054 in 1881. Compulsory powers adopted in 1881. The duty of notifying devolves both upon any medical man in attendance, and also on the occupier whether there is a medical attendant or not. The diseases to be notified are:—Small-pox, measles, scarlatina, diphtheria, typhus, enteric and relapsing fevers, puerperal fever and cholera; power being given to the Corporation to extend the provisions of the Act to other diseases.

The main point of interest in the communication addressed in April, 1882, by the Town Clerk to the Local Government Board on the working of the Act, is to the effect that “the medical officer of health desires me to state that, in his opinion, unless the duty of notifying infectious diseases is imposed upon the medical attendant as well as upon householders, the notification would be delayed or evaded, and any regulations relating to this important matter would practically become inoperative.”

In his annual report for 1881 Dr. Shea refers to the need for extended hospital accommodation, and he states, as regards the Reading Corporation Act of that year, that since it had become law the compulsory notification of disease was working well. The report for 1882 gives certain information tending to show that in such diseases as small-pox, isolation was favoured by early information, and that active measures of prevention were made more possible as regards other diseases under the same

system, but it points out that the sanitary defences of the district are incomplete in the absence of any means for isolating such a disease as scarlet fever. As regards the Act itself it is recorded that it "has worked well up to this time. The certificates are duly forwarded by the medical practitioners, but the public often fail to notify, pleading ignorance of the provision in that behalf, although the requirement has been advertised and freely placarded." The report for 1883 contains no special reference to the system of compulsory notification. The following statistics may be noted.

## BOROUGH OF READING.

Date.	Mortality per 1,000 population.	
	From all causes.	From seven principal zymotic diseases.
1874	18·5	2·2
1875	18·3	2·3
1876	18·2	2·3
1877	17·2	3·0
1878	22·0	3·6
1879	19·2	2·1
1880	19·6	3·4
1881	14·1	0·8
1882*	17·8	2·9
1883	15·9	2·1

\* Act as to compulsory notification in operation.

*Rotherham* (Yorkshire).—Population 34,782 in 1881. Compulsory powers adopted in 1879. Notification required both from the medical practitioner, and from the occupier whether a medical man is in attendance or not. Diseases to be notified :

—Small-pox, “fever if contagious or infectious,” and cholera. In answering the Circular Letter of the Local Government Board, the Town Clerk writing on April 12th, 1882, says:—“So far as the Urban Sanitary Authority of this district are concerned, the regulations now in existence as to infectious diseases have hitherto worked satisfactorily.” The fee payable to medical practitioners is the ordinary one of 2s. 6d. per certificate, but it is added by the Town Clerk that the authorities are greatly dissatisfied at the expense incurred and think that a reduction in the amount of the fees should be made.

It will be observed that the application of the system of compulsory notification of infectious diseases is very limited in Rotherham, and beyond a frequent repetition in the annual reports of the complaint that the town is not provided with either an infectious hospital or a mortuary, provisions which are obviously necessary in order to render useful the information acquired under the Act; there is no record either as to its working or as to whether any effect has been produced by it.

*Salford (Lancashire).*—Population 176,235 in 1881. Compulsory powers adopted in 1882 under a Provisional Order. Notification required both by the medical practitioner and by the occupier, the latter to notify whether a medical man is in attendance or not. The diseases to be notified are those specified in the Parliamentary paper referred to at the commencement of this article on notification.

In his annual report for 1883 Dr. Tatham, Medical Officer of Health for the borough, writes as follows:—

“*Registration of Infectious Sickness.*—From time to time during the last quarter of a century attempts have been made by Sanitarians—and notably by Dr. W. B. Richardson, F.R.S.—to obtain some measure of the prevalence of avoidable diseases throughout the country more reliable than that afforded inferentially by the Death Returns of the Registrar-General. Previously to the year 1880, the Manchester and Salford Sanitary Association had been engaged for upwards of twenty years in collecting and publishing sickness returns for these towns: and from the discontinuance of these returns in that year, up to the end of 1882, I myself succeeded in collecting periodical reports of disease treated at the public expense in our own borough. But all efforts of this kind have hitherto fallen short of the success they deserved because of the merely permissive character of the undertaking, and for want of power on the part of compilers to enforce systematic notification. Within the last few years many of the more important towns of England have taken statutory powers to acquire from local practitioners

reliable information as to the whereabouts of infection, and there is little doubt that the information thus gained has proved of sterling worth. But, besides serving its primary and locally preventive purpose, there is no doubt that the mass of information now regularly supplied to the thirty-eight towns thus fortunately circumstanced, if tabulated and regularly published by some competent authority, might be made to furnish statistical data of the very first importance to the health of the nation.

*"Compulsory Notification of Infectious Disease."*—Up to the latter part of the year 1882, when the Provisional Order came into force requiring notification to the Medical Officer of Health of certain specified kinds of sickness, the Salford public were without adequate protection against the spread of dangerous infectious disease. It is true that persons in good circumstances had previously derived from their private medical attendants many of the advantages which preventive skill can render, and I am the last to underrate the timely assistance thus given. But the fact remains that the majority of the population, and especially that necessitous part of it which is most in need of such protection, has hitherto been absolutely at the mercy of whatever infectious pestilence has from time to time been prevalent; and it may safely be contended that in order to enable the Sanitary Authorities to fulfil this important part of their responsibility, it was essential that they should be fortified with timely warning of impending danger. Subsequent to our receipt of the necessary powers from Parliament, much time was unavoidably absorbed in the necessary preliminary arrangements; but the beginning of the year 1883 saw the Compulsory Notification Act in full operation, and the due administration of its provisions has ever since received the anxious care of the Health Department.

"In the preliminary discussion of the suggested clauses, before their presentation to Parliament, much consideration had naturally been devoted to the delicate task of specifying the persons to be held responsible for the act of Notification to the Authority. The advantages of what is termed the dual system of notification, as well as that by the householder alone, were carefully weighed; but it was ultimately resolved to adopt the principle recently sanctioned by Parliament, which imposes on medical practitioners the sole responsibility of notification.

"Before proceeding further, I desire to offer to the members of the Medical Profession practising in Salford, my sincere acknowledgment for the loyal assistance they have rendered the Health Department in their endeavours to administer successfully the powers with which they have so recently been intrusted. It is no exaggeration to say that, as regards its effect upon the spread of infection, the Act would have remained practically a dead letter had we not received from these gentlemen the intelligent support which they alone can render, and which they have so heartily and so promptly given. Although so short a period of time (barely fifteen months) has elapsed since the passing of the Act, yet I have learned enough of it to warrant my saying that the working of the compulsory clauses in Salford has been of essential assistance to the department in dealing with infectious disease, and that the results already obtained are such as in my judgment to fully justify the expenditure necessarily incurred.

. . . . In no particular has disease-notification proved more uniformly helpful than in the control which it has enabled us to exercise over the dissemination of infection by schools. . . . .

*"Infectious Cases reported under the Notification Act."*—The undermentioned cases of infectious disease have been reported at this office under the Compulsory Notification Act during the year 1883. Every case of sickness here recorded has

either been certified under the Act by a medical practitioner, or has been otherwise medically verified ; and every effort has been made to render the list as complete and free from error as possible.

Districts.	Small Pox.	Scarlet Fever.	Diphtheria.	Typhus Fever.	Enteric Fever.	Puerperal Fever.
Regent Road . . . . .	—	356	11	5	112	12
Greengate . . . . .	—	109	14	5	34	4
Pendleton . . . . .	—	246	26	4	85	3
Broughton . . . . .	6	94	30	—	62	2
Boro' Total (Reported Cases . . . . .)	6	805	81	14	293	21
Total Rate per 1,000 living . . . . .	—	4·2	0·4	0·01	1·5	0·1
(Percentage fatality . . . . .)	—	9·9	29·6	21·4	20·4	33·3

"With respect to the percentage fatality indicated in the bottom line of the above table, it should be mentioned that these figures represent the *true proportional fatality* incidental to the sick cases enumerated in the line immediately above. It would obviously have been easier to give the percentage of registered deaths to cases notified within the same period, but a little consideration will show that such a rate would have been fallacious ; for, on the one hand, some of the deaths registered during the fifty-two weeks of the year may have originated in sickness which had been registered before the commencement of January ; and on the other, many of the attacks recorded towards the end of the year had certainly not been completed at its close.

"*Scarlet Fever.*—Of all the scourges which imperil the lives of children in our great centres of population, undoubtedly the most terrible is scarlet fever. Ever present in our midst, it stealthily works its deadly havoc amongst our little ones, and where it does not actually destroy, too frequently embitters with life-long suffering the existence of its numerous victims.

"Recent experience under our Notification Act has shown, not only that the attacks of scarlet fever are ordinarily far more numerous than those referred to all other infectious fevers in the aggregate, but it has emphasised the fact, long since familiar to sanitarians, that in populations like our own the due limitation of searlatinal poison to persons and places primarily infected taxes to the uttermost the administrative resources of the Health Department. Under these circumstances it may be well to consider somewhat carefully the present and past history of this disease in Salford, with especial reference to its behaviour under recent efforts for its suppression.

"Reliable statistics in sufficient detail are not available for periods anterior to the year 1861, but from that date onwards I have been able to procure trustworthy particulars of searlatinal prevalence, as represented by its fatality, in each month of the twenty-three years since elapsed. With a view, therefore, of affording graphic expression to the effect upon scarlet fever prevalence (1) of the 'forcing' process obtaining between 1861 and 1876, when infection was permitted to thrive unchecked by isolation, and (2) of the opposite process of extermination which the possession of a fever hospital has enabled us more recently to inaugurate, I have plotted on the accompanying diagram [not reproduced] a series of perpendicular columns representing, in annual rates per 1,000 living, the fluctuation in the Salford mortality from scarlet fever in each month of the last twenty-three

years. We are thus furnished with a standard, which, whilst showing the normal curve of scarlatinal fatality in Salford, will in future years afford a valuable means of gauging the effect on its prevalence of our recently-acquired notification powers, and other measures complementary to these, for the suppression of infectious disease.

" During the year 1883 the Health Department received medical notification of the occurrence of 805 cases of scarlet fever, as compared with 154, the number *voluntarily* reported in 1882, during which year the Notification Act had not yet come into full operation. Of these 805 cases 80 terminated fatally, the ratio of fatal cases to attacks being therefore equal to nearly 10 per cent. The following figures show the relative prevalence and fatality of the reported attacks, and also the proportion of scarlet fever patients removed to hospital in each quarter of the year :—

	March Quarter.	June Quarter.	September Quarter.	December Quarter.
Reported attacks . . . .	160	166	186	293
Rate per 1,000 living . . .	4·71	3·52	5·17	2·57
Percentage fatality . . . .	6·3	4·2	11·8	14·0
Percentage of Hospital admissions . . . . {	20·0	30·7	21·5	28·0

It should be added that Salford has long been provided with a hospital for infectious diseases and with means of disinfection, and also that within recent years considerable efforts have been made to adapt these provisions to the increasing requirements of the population. The 1883 report refers to the fact that a new disinfecting apparatus by high pressure steam has been provided, and proof is afforded of the extensive use to which the available means for preventing the spread of infectious disease are being put.

*Stafford* (Staffordshire).—Population 19,977 in 1881. Compulsory powers adopted in 1880. Notification required from the medical practitioner and also from the occupier whether a medical man is in attendance or not. Diseases to be notified :— Small-pox, scarlatina, diphtheria, typhus, enteric and relapsing fevers, puerperal fever, and cholera.

The annual report by Mr. W. E. Clendinnen for the year 1881 merely states that the Act was working well, and that it had been the means of enabling the Authority to take action in certain cases to prevent the spread of infection. A similar

statement is renewed in the reports for 1882 and 1883, it being added that no difficulty had occurred in connexion with the notification, as to which the hearty co-operation of the medical profession had been met with.

*Staleybridge* (Lancashire).—Population 22,785 in 1881. Compulsory powers adopted in 1881. Notification is required both from the medical practitioner and also from the occupier, and the diseases to be notified are :—Small-pox, scarlatina, diphtheria, typhus, typhoid, and puerperal fevers, and cholera.

In the letter addressed by the Town Clerk to the Local Government Board in April 1882, it is stated that “no complaint has been made relative to the clauses either by any medical practitioner or by any housholder, and the clauses are willingly carried out by all parties concerned.” There is little or nothing to be gained from the reports of the medical officer of health as published in the local press. But there does not appear to be any hospital for the isolation of cases of infectious diseases, and it is noteworthy that whereas the mean annual death-rate from all causes from 1875 to 1881 was 24·0 per thousand, it was only reduced to 23·3 during the three years 1882 to 1884 after the compulsory clauses came into operation, and even this exceeded the mean rate, viz. 21·7, for the three years immediately antecedent to 1882. As regards “zymotic” diseases, which should be mainly influenced by notification, the mean rate per thousand for the “seven principal zymotic diseases” was 2·8 for the seven years 1875 to 1881, 2·5 for the three years immediately preceding 1882 when the Act was first in full operation, and it rose to 2·8 for the three years 1882 to 1884, the increase being due to the prevalence of scarlatina and diphtheria, two diseases which of all others call for efficient isolation of first cases.

*Warrington* (Lancashire).—Population 44,452 in 1881. Compulsory powers adopted in 1879. Notification is required of the medical practitioner and also of the occupier whether a medical man is in attendance or not. The diseases to be notified are :—Small-pox, scarlatina, diphtheria, typhus, typhoid, relapsing and puerperal fevers, and cholera.

In the letter addressed to the Local Government on 14th April, 1882, in answer to the official circular, the Town Clerk states that the working of the provisions relating to notification

have been most satisfactory. Once only had it been necessary to proceed against a medical man for failing to give notice,—the medical profession in Warrington, as a body, having readily assisted in the working of the provisions. The exceptional case led to the imposition of costs only, the medical practitioner pleading inadvertence. He was however “known to entertain a strong objection to the provisions.”

The annual reports of Mr. J. H. Gornall, medical officer of health for the borough, do not appear to have been printed until 1881. A general diminution in the total mortality during 1880 and 1881 is in the report for 1881 attributed amongst other things, to notification, coupled with the isolation of infectious diseases in the very excellent hospital erected for the purpose by the sanitary authority. Still, scarlet fever was very prevalent, twenty-three deaths having resulted from it. The total number of cases of this disease notified was 362, and of these cases 281 were admitted into hospital. Mr. Gornall admits that with notification and a hospital it may be asked why the disease thus spread; but he is inclined to consider that the extension would have been on a much wider scale had it not been for the notification, and that one main cause of the prevalence was the mildness of attacks which led to their passing unnoticed until too late.

The 1882 report explains how the scarlet fever became more malignant in that year; 306 cases of it were notified and 203 were admitted into the hospital; 52 scarlet fever deaths being registered in the borough. Mr. Gornall points out that complete stamping out of such a disease cannot be immediately expected as the result of notification, but he believes that notwithstanding the mortality much was done in 1882, and he instances the fact that 383 deaths were registered from scarlet fever in 1863. He admits a certain amount of discontent amongst the population against the Compulsory Act which, in Warrington, gives special powers to the Corporation in enforcing removal to hospital whenever the medical officer of health certifies that any person within the borough is suffering from a dangerous infectious disease and “is without proper lodging and accommodation, enabling the case to be properly isolated so as to prevent the spread of the disease, or to be properly treated;” but he asserts

that a feeling of confidence is gradually being spread amongst the public in the matter.

In 1883 the scarlet fever deaths were 26 in number, 127 cases having been reported under the Act. The cases admitted into the hospital were ninety-two in number. General satisfaction is expressed as to the working of the Act, although it is evident that some discontent still prevailed in the district. It is not however clear whether the discontent had to do with compulsory notification as such, or with the system combined with the special powers as to removal to hospital.

The subject of the continued prevalence of scarlet fever in Warrington, notwithstanding the notification and the hospital provision, is dealt with in Dr. Thorne Thorne's Report on the Use and Influence of Hospitals for Infectious Diseases;<sup>1</sup> and coupling the statistics there given with those since published, it would appear that notification with isolation had checked so rapid a growth of the disease as had been experienced in some former years, but that a very large total mortality still tended to spread itself over a series of years. The experience available is however too limited to warrant any final inference being drawn.

The following statistics bear upon the subject of notification in Warrington :

Date.	Mean death-rate per 1,000 living.	
	From all causes.	"From principal zymotic diseases."
1876—1880	23·3	3·8
1881	20·2	2·2
1882	24·3	5·9
1883	21·6	2·7

<sup>1</sup> Supplement by the Medical Officer to the Tenth Annual Report of the Local Government Board, 1882.—[c. 3,290.]

REPORT ON AN EPIDEMIC OF TYPHOID FEVER AT  
PLYMOUTH, LUZERNE COUNTY, PENNSYLVANIA.

BY M. S. FRENCH, M.D., AND E. O. SHAKESPEARE, M.D.

*Location and Topography.*—Plymouth is a town in the Wyoming valley of Pennsylvania, of about 8000 inhabitants, situated on the left or north-west bank of the Susquehanna river, two and a-half miles below the city of Wilkesbarre, which is located on the right bank of the same stream, is the county seat of Luzerne county, and has a population of about 30,000.

The sewage of Wilkesbarre is in part retained in sinks appertaining to dwellings, and in part directly emptied into the river through an old canal; two or three minor sewers and numerous private drains besides filth are conveyed into it by means of the natural flow of the surface water. The drainage of a large portion of this city, however, flows through a long canal, and is turned into the Susquehanna at a point nearly three miles below the town of Plymouth. It should be stated that perhaps only one-third or one-half the sewage of Wilkesbarre reaches the river at any point, the remainder being retained in the disconnected sinks. The abattoirs of Wilkesbarre are located on the banks of the river, between that city and Plymouth, and much of their garbage finds its way into the water. Besides this pollution of the water, which flows past Plymouth, the river receives some surface sewage from Kingston, a small town opposite Wilkesbarre, as well as the water from several coal mines. . . . .

*Water Supply.*—During nine months of the year Plymouth is supplied abundantly with pure water from a stream which dashes rapidly down the sides of the mountains. Beyond the western edge of the town, and above it, this mountain rivulet is dammed by solid masonry at four different elevations. Dam No. 1, the lowest, is capable of storing 250,000 gallons of water; the capacity of No. 2, is 1,500,000 gallons; that of No. 3 is 3,000,000 gallons,

and No. 4, the highest, is estimated to hold 5,000,000 gallons. The water is distributed through the town by the Plymouth Water Company, through their pipes and hydrants, which ramify everywhere, except at Broadway and Ridge Row. The exception is worthy of note, for it gives the key to the explanation of the manner of the outbreak of the epidemic, as will be shown later. The mountain water is distributed from the lower and smallest reservoir, No. 1, in the following manner: The water-main descends along the stream to about the level of the highest principal street, which runs along the hill side parallel to the river, called Back street, and there divides into two branches. The higher branch follows the course of Back street on the hill side, and also distributes water along the streets which intersect it. The lower branch descends towards the Susquehanna until the level of the lowest principal street—already mentioned and called Main street—is reached; it then runs eastward along Main street the length of the town, supplying water to the streets which it crosses, but principally to the lowest streets. It should be understood that in ordinary times the water-mains in Main street and in Back street are inter-connected at various places by the pipes in the cross streets. During periods of drouth, the Water Company is in the habit of resorting to the Susquehanna water, pumping it directly into the main of the lower or Main street. Nearly all the householders of the town use hydrant water, yet there are scattered here and there a small number of wells or pumps, which supply water to a few people.

The population of Welsh Hill, be it noted, are not furnished with water by the Water Company of Plymouth, and therefore do not drink the "mountain water" when they are at home. Their constant water supply, the year round, is principally Susquehanna water. There are, however, a small number of wells. The river water is forced up by the powerful pumps of the Delaware and Hudson Coal Company, around whose "breaker" these villages and suburbs are built.

The pumping station of the Plymouth Water Company is on the edge of the river, a little above the centre of the town. The "suction pipe," which drew the water from the river at the last time of pumping, extended out into the river-bed four hundred and fifty feet, and reached within seventy feet of a small alluvial

island in the middle of the river. The river water is sucked into the pipe through a "snorer" raised a little above the bottom. The depth of water at this spot was eight feet. The greatest depth of water was twelve feet at a point eighty feet nearer the Plymouth shore, where, of course, was located the main channel. It should be remarked here that the river water has heretofore been drawn from the more distant channel on the other side of the island ; but the pipes had been broken, and this necessitated the use of the "snorer" this year at the spot indicated. The pumping station of the Plymouth Water Company is located just two miles below the point where the lower sewer of Wilkesbarre empties into the river, and the main channel of the river is on the Plymouth side of the above-named island.

This system of water supply has existed since 1876. During the dry season of every year the Water Company has habitually pumped Susquehanna water directly into the water-mains. . . .

*Conditions Immediately Preceding the Outbreak of the Epidemic.*—In consequence of the frozen state of the streams the usual supply of mountain water became inadequate. This natural drouth of water was increased by extravagant waste, many of the inhabitants allowing their hydrants to run constantly in order to keep the water from freezing. The water in the three lower reservoirs became nearly exhausted.

March 20th of this year, at 5 o'clock P.M., water from the Susquehanna was pumped directly into the main of the lower street, and this was continued without interruption until March 26th, at 5 P.M. During this period the river water was unusually befouled by the sewage of Wilkesbarre, the water in the river being lower than for years, and its surface frozen tight.

It was believed that none of the Susquehanna water reached the main which supplies Back street on the hill side, for all connexions between it and the main on the lower or Main street had been cut off, except at the point, already mentioned, high up in the town, where the large pipe, descending from the reservoir, divides into the upper and lower main. . . . The water distributed from the Back street or upper main was believed to be at that time exclusively mountain water. But we found, however, that water from the Susquehanna had not only reached the level above named, but had actually been

forced back into the reservoir, the level of its water having been raised three feet during two days of the pumping. . . .

It is, however, an unquestionable fact that during this period of pumping the upper or Back street main received by far the greater proportion of mountain water, whilst the lower or Main street main distributed the greater proportion of Susquehanna water. . . .

*Usual Prevalent Diseases.*—The inhabitants of Plymouth constantly suffer with intermittent fever. There are also always a few scattered cases of typhoid fever among them. The town is now, and is usually, in a very insanitary condition. Up to the 10th of April there was nothing uncommon in the prevalence of these diseases either in Plymouth or in Wilkesbarre. Like other communities, Plymouth heretofore has had most of its typhoid fever during the summer and autumn months.

*Outbreak and Nature of the Epidemic.*—The disease suddenly appeared about the 10th of April, and spread with extreme rapidity, fifty cases occurring daily from the 10th to the 20th, by the latter date more than 500 of the inhabitants of Plymouth being prostrated with the fever. It continued to increase rapidly, until it is now estimated from reliable data that out of a population of 8000 nearly 1200 have been or are ill of the disease. Thirteen physicians reside in the town. . . . During the first weeks of the epidemic there was among the local physicians the greatest difference of opinion not only as to its origin, but also as to its nature. . . . Later it began to be appreciated by some that they were having to do with one of the worst epidemics of typhoid fever on record. . . . and it had been ascertained that it was probable that the drinking water was responsible for the epidemic. On the day of our arrival the report of a committee of Wilkesbarre physicians, Drs. Murphy, Taylor, and Miner, was published in a local paper. In their report they mention the probable contamination of the mountain stream by the dejecta from a person who had been suffering from typhoid fever during January, February, March and April. This person was ill in a dwelling situated on a declivity not eighty feet from the water of the mountain brook, which flows rapidly from the fourth to the third reservoir. In their report it is also mentioned that in a house 600 feet below the lower

or distributing reservoir, immediately on the banks of the stream, there was located one of the earliest cases of fever, and that the patient had never used pipe or hydrant water, and consequently could not possibly have been contaminated by Susquehanna water, for the water exclusively used was dipped from a pool in a running stream and came from the overflow of the lower reservoir. Their report also stated that during the first weeks of the epidemic, almost without exception those persons in the town who exclusively used well water did not take the disease, and that the portions of the town most affected were those exclusively supplied, as they thought, with mountain water. They concluded therefore that the mountain water had caused the epidemic, and that it had been polluted by the evacuations of a single case of typhoid fever in a house on the side of the mountain. They also believed that the disease was typhoid fever, and that the chief danger had passed and the original cause no longer existed.

Our investigations began by making post-mortem examinations. . . The results of these autopsies succeeded in convincing those physicians of the town who had up to that time firmly believed that the disease was not typhoid fever.

This much being determined, investigation into the origin and spread of the epidemic was next prosecuted.

We found first, that, during the period of pumping, some of the Susquehanna water had reached the lower reservoir, as already stated, and had consequently not only reached all portions of the town supplied by the Water Companies' pipes, but had also reached those people in the little fever-stricken dwelling located on the bank of the stream below the lower reservoir, who drew their water exclusively and directly from the brook. This fact of course complicated the question of the source of pollution of the drinking water, although it still seemed probable that it was located along the mountain stream, for it was found that most of the sick had used water which was least contaminated by the Susquehanna. We found, second, that in the village of Broadway, a suburb of Plymouth containing forty families averaging at least five per family, there are only two wells, of which the water is considered by the inhabitants to be so unwholesome that it is rarely used for drinking or culinary

purposes. The chief water supply there is that of the Susquehanna river, through the pumps and water-mains of the Delaware and Hudson Coal Company, the suction-pipe of which extends out upon the bed of the river eighty feet from the shore and into the main channel at a point *a half mile nearer the sewers of Wilkesbarre* than is the pumping station of the Water Company of Plymouth. In this village not a single case of fever has been found.

In an adjoining village called Ridge Row, where twenty families live in ten houses, the people are supplied with the same kind of water as are those of Broadway. The one or two cases of fever here are of persons who had frequented the town and had there drunk water from the hydrants. Not one case exists among those who had exclusively used the Susquehanna or river water.

This freedom from sickness at Broadway and Ridge Row clears up the doubt caused by the entrance of Susquehanna water into the reservoir, for in other portions of the town the ratio of the sick to the population is above 1-10. We are forced to the conclusion therefore, that notwithstanding the unusually large amount of sewage in the Susquehanna water at the time of the last pumping, the river water had nothing whatever to do with the cause of the present epidemic, but that on the contrary the cause of the disease was conveyed to Plymouth by the mountain water.

*Cause of the Disease.*—As to the cause we can but confirm the conclusion of the Wilkesbarre committee, although they had not before them all the facts.

The nurses in attendance upon the fever patient in the house by the side of the mountain brook, were at night in the habit of carrying out the evacuations of the bowels and throwing them on the ground towards the stream. During the day the dejecta were emptied in the privy, which had no sink or excavation beneath it but rested upon the surface of the ground, which here also sloped towards the stream. During January, February, and March the ground was frozen and most of the time covered with snow. About March 25, a thaw began and continued for several days, and by April 2, considerable rainfall had taken place. A large part, if not indeed the whole, of that portion of

the three months' accumulation of the intestinal matter which had been carried out in the night and thrown towards the stream, was no doubt suddenly washed into the brook not sixty feet distant. The stream is rapid and narrow, and it flows over a rocky bed. The point where this contamination took place is not two miles from the lower reservoir, and the current is faster than a man can walk. About the time of this thaw and a little before it, the patient had numerous and copious haemorrhages from the bowels, usually in the night.

The intestinal discharges of typhoid fever patients contain an infectious agent which has great vitality and enormous power of multiplication and propagation. This infectious matter is not killed but only placed in a state of hibernation by freezing, ready to promptly resume its virulence when the temperature rises and favourable conditions are present. . . .

Unfortunately for Plymouth perhaps the only fortuitous or accidental circumstance which could possibly have caused a so widespread epidemic of typhoid fever there, is just the one which did happen, viz.: the sudden entrance into the general water supply, at a time when the amount of water was unusually small, and when it was also otherwise contaminated, of a large amount (three months' accumulation) of faecal matter containing large quantities of the specific infective agent of the specific infective disease from which it had come. . . .

In view of all the facts of this epidemic, and of the knowledge of others, we have no hesitation whatever in confirming the conclusion that the source of infection at the outbreak of the Plymouth epidemic was in the evacuations of the bowels of the one typhoid fever patient in the house already mentioned situated near the bed of the mountain stream which supplies the town with water.

# THE PRACTITIONER.

OCTOBER, 1885.

## Original Communications.

### ON SOME RECENT ANTIPYRETICS: KAIRIN, ANTIPYRIN, AND THALLIN.

BY J. E. BLOMFIELD, M.R.C.S. ENG.

*Radcliffe Travelling Fellow.*

WITHIN the last twenty years the treatment of fever, that is, the abnormal heat of the body during disease, has received much attention from therapeutists, and we are now in possession of a group of remedies by which this heat may be reduced. At first the means chiefly employed were its direct abstraction by the contact of cold water and ice, and in many cases these will not be superseded, but in others there are reasons against this treatment, and we can then have recourse to one of the antipyretics, the list of which is now rather a long one.

In the following pages I propose to give an account of the latest additions to this list, which have occupied the attention of scientific and medical men sufficiently long, so that something definite is known as to their action on the body. On the Continent they have been largely employed in the treatment of many febrile diseases, and a short account of the results obtained cannot fail to be of interest to English medical men, who, owing to recent legislation, have not the same opportunities of testing the action of newly-invented drugs which is possessed by their brethren in other countries.

This account does not lay claim to any originality on my part, but is gleaned from the numerous papers which have appeared in recent French periodicals, reports of the meetings of scientific and medical societies, and theses presented to the Faculty of Medicine, besides observation from time to time of patients treated with these drugs in the hospitals of Paris.

Under the head of each drug I propose to give an account of its chemical and physical nature, of what is known of its action on the healthy body, of the extent of its uses, and of the results obtained in the treatment of various diseases.

#### KAIRIN.

This was the first of the series of these closely related bodies. It was discovered in 1882 by Otto Fischer, of Munich, and was prepared by him from a body—quinoline. Now this body quinoline is formed as a colourless liquid when quinine, cinchonine and some other alkaloids are treated with caustic potash and subjected to distillation, and from it many derivatives have been prepared, one of which rejoices in the name of tetra-hydroxy-methyl-quinoline, or more simply kairin, and its therapeutic action was first made the subject of investigation by Professor Filehne, of Erlangen, who came to the conclusion that it was a valuable antipyretic.

It is a yellowish white powder, of a faint smell and bitter taste, soluble in water and alcohol, slightly in ether. Its watery solutions have a tendency to change colour and become of a claret tint. With various reagents, such as nitric acid, solution of iodide of potassium, or chlorine water, it gives more or less characteristic precipitates or colouration; but the most generally useful test is that with strong nitric acid, which produces an orange red in solutions as weak as one per ten thousand, and with this reagent it can readily be found in the urine so soon as an hour after its administration, or if given hypodermically in less time. With perchloride of iron it gives a colour which is first violet and then red.

Its physiological properties have been studied by various observers in France, by MM. Hallopeau and Girat, the results of which were contained in a thesis presented to the Faculty

of Medicine in 1883, and by MM. Loze and Conscience, whose conclusions are contained in another thesis presented in December, 1884; and certain facts have been well ascertained as to its action on the healthy body, which we will now proceed to relate. In the last-named memoir Dr. Conscience gives the following as the effect of kairin on dogs and guinea-pigs.

Intense cyanosis of lips and tongue, with diminution of respiratory movements, abundant salivation, rapid fall of temperature, accompanied by fits of shivering and diminution of the pulse-rate in proportion to the fall of temperature; convulsions and epileptic movements, and finally a comatose condition; diminution, and finally total abolition of cutaneous sensibility; paralysis and contraction of the limbs; diminution in the quantity of urea excreted.

After death the arterial blood was found to be black, the heart to be arrested in a state of diastole, with the left ventricle full of blood. The lungs, intestines, and bladder were congested, and the lines of the arteries marked with peculiar distinctness by the dark colour of the blood. This peculiar action on the blood has been the subject of experiment by MM. Loze and Brouardel,<sup>1</sup> in which they have found that the respiratory capacity of the blood is very considerably reduced, in some cases amounting to nearly one half. The method of experimenting consisted in determining the amount of gases yielded by 100 volumes of blood before and after the administration of kairin, and further analysis of the gas showed that the amount of nitrogen was nearly constant, indicating that the action was on the oxygen and carbonic acid. In the course of these investigations another interesting fact was brought to light, viz. that the action of this body on the blood produced methæmoglobin—one of the products of the deoxidation of oxyhaemoglobin. According to a Russian observer the blood corpuscles undergo a change of shape which appears to be the same as that described by Dr. Roberts as produced by solutions of boracic acid, in which the central part of the corpuscle projects as a rounded prominence from one side, giving the corpuscle the appearance of a cupola.

In accordance with the diminished respiratory movements, and with the altered condition of the blood, the respiratory

<sup>1</sup> Meeting of the Société de Biologie, May 1884.

changes were found in the experiments of Dr. Conscience to be considerably modified and in proportion to the fall of temperature, as seen in the accompanying table taken from his thesis:—

Oxygen absorbed in 1 hour.	$\text{CO}_2$ produced in 1 hour.	Temperature.
Cub. metre 9.592	5.107	39.9° C.
„ 7.713	5.187	39.1
„ 4.175	1.19	36.3
„ 4.341	3.343	36.6

As regards the fall of temperature, experiments have shown that this is always produced in the administration of the drug to healthy animals, but not to any very large extent unless the doses are considerable. If a poisonous dose be given, a fall of as many as 9° Centigrade may be recorded before death takes place; but in the case of animals rendered febrile by the injection of septic matter, a fall of 1°.5 or 2° is quickly brought about with doses that produce no other marked effect.

Another interesting fact concerning the action of the drug on the healthy animal is, that during its administration the amount of urea excreted is considerably lessened.

We will now pass to the therapeutic side of the question, and we find that kairin has been given by numerous observers on two different plans. The first, that of Filehne, is to give the drug in small doses, varying from ten to fifty cubic centigrams, according to the general state of the patient, every two hours making use of the thermometer before each dosage, and being guided by that instrument in its administration; the second is that of Riess, who gave large doses at a time, varying from 1.50 grm. to 3 grms. when he found that a lowering of two or three degrees Centigrade took place which lasted about five or six hours, but in one case of typhoid he reduced the temperature to 35°.8 and the patient into a state of collapse, which however passed off.

The drug has been given by the stomach and by hypodermic injection; the latter method is much praised by Dr. Queirolo of Bologna, who dissolves a quantity varying from ten to fifty cubic centigrams in a wineglassful of water, of which solution he uses ten to thirty cubic centimetres as an injection, and

asserts that he has seen no ill results arise from this mode of administration. The ill results that have been recorded against the drug are abundant perspirations which quickly follow its administration but do not last any length of time; occasionally vomiting has been produced, and fits of shivering; on the re-ascent of the temperature a peculiar nasal pruritus and dryness of throat, and sometimes frontal headache.

We will now pass to the consideration of

#### ANTIPYRIN.

This body, known chemically as dimethyl-oxyquinicine, was discovered by Dr. Knorr, of Erlangen, and first subjected to experiment by Professor Filehne, of Munich.

It is a crystalline powder of a very pale salmon-pink colour, with a slightly bitter flavour, but is more easily taken by patients than kairin; soluble in water, alcohol, chloroform, and ether. Like kairin it gives various precipitates and colourations with different reagents, the most useful of which for general purposes to determine its presence are those with nitrous acid and perchloride of iron; with the former it gives a green colour and with the latter a colour resembling the pigment "dragon's-blood," or when the solution of perchloride is strong, a port-wine colour. Its physiological properties have been investigated by M. Bouchard,<sup>1</sup> by MM. Henocque<sup>2</sup>, Arduin<sup>3</sup>, and Huehard<sup>4</sup>, from whose researches it would appear that a toxic dose administered to a mammal produces a great fall of temperature, as much as 6·2 degrees Centigrade; the respiratory movements are at first quickened and then become much slowed, the heart-beats decrease in number with the fall of temperature, and after death the heart is found arrested in diastole. Tonic and clonic convulsions are produced, and a peculiar state of rigidity of the muscles, which allows a limb to retain any position in which it is placed, reminding the observer of the cataleptic condition. In an interesting experiment by Professor Bouchard it was shown that this action was due to the nervous system and not to an

<sup>1</sup> *Comptes Rendus de Soc. de Biologie*, No. 43.

<sup>2</sup> *Gazette hebdomadaire*, No. 50.

<sup>3</sup> *Thèse de Paris*, 1885.

<sup>4</sup> *Société de Thérapeutique*.

action of the drug on the muscles directly, for he found that if a limb was cut off from the central nervous influence by section of its nerve, it manifested none of this stiffness, which was found, however, in all other parts of the body.

No action similar to that of kairin on the blood-corpuscles and hæmoglobin has been recorded, though experiments have been made with this object in view, but it has been found to produce a diminution in the excretion of urea. Dr. Queirolo has made an observation which is of importance in attempting to explain its antipyretic action, and interesting when taken in conjunction with the clinical fact of profuse sweats caused by its administration, and that is, that it produces a dilatation of the cutaneous blood-vessels before the diminution of the temperature commences, a fact which might tempt us to seize the idea that it is this profuse sweating which causes the fall; but it must be remembered that this is no constant or necessary effect, and is not found when the doses are small.

I have tried the action of a five per cent. solution on the blood-corpuscles, but failed to find anything analogous to that described above of kairin.

On a healthy man, in non-toxic doses, antipyrin does not appear to lower the temperature, and it has been asserted to have the opposite effect. In the course of the experiments of MM. Arduin and Henocque a peculiar haemostatic action was found, which may possibly be turned to clinical account one of these days, but the data are not yet sufficient to pronounce with any confidence on this property. They were induced to make experiments in this direction by finding that blood flowed with difficulty from the vessels of an animal under the influence of antipyrin, and when comparative experiments were instituted with ergot and perchloride of iron as to the time in which each would arrest an artificial haemorrhage the balance was in favour of antipyrin.

We will now turn to the clinical and therapeutic actions of the drug; and first as to its mode of administration. It has been administered by the stomach, rectum, and skin. The first is probably the best way, unless any particular reason exists against its use. When given hypodermically a good deal of pain is produced, and when given by the rectum its usual effect is

manifested, which differs in no way from that produced by injection into the stomach. It has been employed in large doses and in smaller doses given frequently, and there is little doubt that the latter is the better mode of administration, and less liable to produce the few disagreeable symptoms that have been recorded against this drug. Of course in considering the dose, we must bear in mind what effect we wish to produce. If we are in the presence of an acute febrile disease, whose temperature curve is rapidly approaching the hyperpyretic region, it would be well to administer one large dose, but if on the other hand we are dealing with a chronic febrile disease, such as typhoid or phthisis, it is well to administer it only in small doses sufficient to produce a slight fall in the temperature, and at such a time as we know the fever is on the ascent. It may be stated that the ordinary dose is a half to two grammes, or eight to thirty grains.

As regards the disagreeable consequences that have followed its administration, there have been recorded : a roseolous rash which soon disappears, sometimes vomiting after large doses, and profuse sweating, which may according to some authors produce a state of great exhaustion ; so that it can be plainly seen the drug requires to be given with consideration and judgment, but it is freer than many antipyretics from the production of nervous troubles, such as shiverings, headaches, and singing in the ears, deafness, &c.

As far as my limited experience goes, I have seen none of these bad effects except the sweating, which is profuse but seems to have no bad effect on the patient. The drug can be found in the sweat within two hours after its administration.

The diseases in which the drug has been given form a long list, practically the same as a list of febrile diseases, and I do not propose to say much except on those where it seems to have a special value.

In typhoid fever the drug has been very largely employed, and the result arrived at may be stated to be a constant fall of temperature of a degree or more, varying with the dose. As may be imagined, it exercises no effect on the course of the malady, but is useful in combating the symptoms of fever, and it may be given in the afternoon or evening, as the temperature

curve is commencing its ascent, with confidence that a fall of temperature will be produced ; which fall, however, is not of long duration, lasting about six hours, unless more of the antipyrin be administered. In some observations made at the Hertford British Hospital in Paris by Dr. Mackew, he informs me that he noticed vomiting several times during its administration (but this was not necessarily due to the drug), and a rash as above described with the first doses (which were large, thirty grains) ; but a tolerance appeared to be established, for subsequently the rash was not produced. He further found that atropin or oxide of zinc would control the sweating if given before the antipyrin. The conclusion arrived at was, that it was of undoubted value in the treatment of this disease.

In tuberculosis and pulmonary phthisis antipyrin has been largely employed, and observers speak very highly of its action when given in small doses such as three or four grains for several days consecutively, for not only does it lower the temperature, but at the time "the patient experiences a sensation of *bien être* quite remarkable, the dyspnœa is calmed, the sleeplessness disappears," so much so, that M. Huchard speaks of it as the specific, not of tuberculosis, but of the tuberculous fever. In these small doses it does not produce the sweating which would be in phthisis a very undesirable result. It is possible, but I am not aware of any observations on this point, that its haemostatic action, before described, may be of use in this disease. [Compare *Practitioner*, xxxiv. 321.]

In acute rheumatism the results obtained do not agree, possibly from the employment of different doses. Some authors praise it as having an action similar to, but quicker than, the salicylates while others deny that it is of any use at all.

#### THALLIN.

This body, whose chemical name is tetra-hydro-para-methyl-oxyquinolin, derives its more useful appellation from the green colour which its salts give with perchloride of iron. It was first used as an antipyretic by Rudolf von Jaksch, of Vienna, but it has not long been before the medical and scientific public, so that I am not aware of any observations giving its actions on

the healthy body and its toxic effects ; but it has been used by M. Huchard and by Professor Jaccoud in various febrile diseases of which I will give a short account.

Professor Jaccoud made it the subject of one of his interesting clinical lectures, in which he stated that he used the sulphate and the tartrate and gave it forty-three times to eleven patients suffering from typhoid, tuberculosis, pneumonia and erysipelas. The dose varied from 100 ccm. to 10 ccm., but in the case where he gave 100 cubic centigrams in divided doses of 25 ccm. every half hour he produced a fall of temperature to 32·4 and a state of collapse which required energetic measures to combat.

As to its antipyretic effect in typhoid with the doses and their result, we will take the following :

9th day of disease	75 ccm.	produced fall of	3°6
8 following days	50 ccm.	" "	2°7
18th and 19th days	45 ccm.	" "	2°5
20th and 21st days	30 ccm.	" "	.8

From which it can be seen that its effect is well marked and rapidly produced, for as a rule the temperature began to fall in about two hours, and the abatement lasted about five hours. In the Professor's experience, thallin produces less perspiration than kairin and antipyrin, with a total freedom from sickness and headache.

The professor concludes "that in thallin we possess an antipyretic which in this quality surpasses all the others. None produce such effect and none act in such small doses with so little inconvenience. Thus if we use it in doses of five to ten ccm. every hour, we should maintain in all probability our patients in a state of apyrexia, but the effect on the course of the disease is nil."

The conclusions arrived at by M. Huchard are similar to the foregoing ; he noticed the general freedom of the drug from undesirable effects, but found that shivering was produced on the re-ascent of the temperature.

It has been given in cases of intermittent fever and was found to have an action on each access of fever, but not on the malady as a whole, thus offering a strong contrast to quinine.

From the foregoing account it will be seen that these bodies are really useful additions to our list of antipyretics, but we must wait for further experience to decide on the relative merits of each. In fact this whole group of drugs well merits a more extended study, so that we should be able to give a scientific classification of them, according as they act on the production or distribution of heat, and if on the production, by what means this is brought about, whether by the thermogenetic centres of the cerebro-spinal system, or more directly by diminishing the oxidising power of the blood. In the above recorded facts we see an indication of a difference of action between such closely allied bodies which further knowledge may break down, but it would appear that kairin acts on temperature by diminishing the oxygen-carrying power of the haemoglobin, while antipyrin—according to the experiments of Queirolo—dilates the vessels of the skin.

The idea of the existence of thermogenetic centres is rapidly gaining ground, and we may see in the obvious action of these drugs on the nervous system a reason for supposing that this is one of the ways in which their effect is brought about.

## NOTE ON CANNABIS INDICA AS A NARCOTIC.

BY H. LEWIS JONES, M.B. CANTAB.

THIS drug has proved of great use in a number of cases where I have desired to produce sleep, especially when sleeplessness was accompanied by delirium.

In the delirium of typhoid fever and erysipelas, and in delirium tremens, it is most valuable, a few doses being sufficient to give refreshing sleep. It is important to give the drug in sufficiently large doses. Two to three grains of the extract can be taken in the form of pill every four or every six hours; frequently the first dose is sufficient. I now prescribe cannabis indica as the routine treatment in all cases of delirium tremens coming under my care, whether simple or complicating injury or disease.

In only one case has there been complaint of hallucinations. It had been ordered for a case of typhoid fever with much sleeplessness, in an excitable young woman; after two or three doses she asked that the drug might be discontinued, saying that it caused her to see visions of beautiful gardens and the like. All the other patients have been hospital cases. It is possible that among educated people mental disturbance would be more frequent. I have heard of one case where two grains of the extract were said to have made a woman temporarily quite mad. Personally doses of the extract of Indian hemp, up to four grains, produce a mild narcotic effect, the only abnormal sensations noticed being numbness of the extremities and slight mental confusion.

## SHORT NOTES ON THERAPEUTICS.

BY H. MACNAUGHTON JONES, M.D., F.R.C.S.I. AND EDIN.  
*Examiner in the Royal University.*

(Continued from p. 180.)

### AURAL THERAPEUTICS.

The following table gives a more complete analysis of the diseased conditions met with in these five hundred patients. In the instance of perforation of the membrana tympani, I record the number of *ears* in which perforation existed. The other numbers refer to the patients affected, save where a different affection was present in the two ears.

Tinnitus aurium..... present in 130 patients.

#### *External Ear and Meatus.*

Cerumen (with collection of epidermis and fungus)	present in	92 patients.
Tumour of auricle.....	"	2 "
Injury or foreign body in the meatus.....	"	21 "
Inflammatory states of the meatus .....	"	24 "
Furuncle and abscess , , .....	"	28 "
Polypus.....	"	18 "
Exostosis .....	"	13 "
Eczema .....	"	12 "

#### *Middle Ear and Eustachian Tube.*

Myringitis .....	.....	present in 12 patients.
Catarrhal states of the tympanic cavity and mem- brane .....	,	200 ,,
Membrana tympani perforated in .....	,	132 ears.
Acute and chronic suppurative catarrh .....	.....	present in 33 patients.
Collapse, closure, or obstruction of the Eustachian tube from various causes .....	,	122 ,,
Polypus of the middle ear .....	,	17 ,,

*Internal Ear and Labyrinth.*

Total number of patients with affections of.....	95
Ménière's symptoms .....	present in 8 patients
Mastoid process, affections of .....	, 5 ,

I would wish to make a few remarks on the origin of the deafness, or rather on the ascribed source in a certain proportion of patients who were able to trace either the deafness, pain, or inflammation to some definite cause. In over fifty per cent no predisposing cause could be assigned or discovered for the ear affection. In many, the deafness had crept on insidiously, without pain, and not until conversational power suffered either through the more obvious difficulty of hearing the voice when spoken to, or that more slowly perceived proof of mischief, the inability to hear general conversation at table and in society, when several people are speaking at the same time, did the patient realise the fact that any impairment of hearing threatened. Less frequently in the case of the ear than of the eye does the failure of the hitherto perfect organ rouse the person to the knowledge that some imperfection has already existed which has passed unobserved until both organs begin to suffer in function. And, so long as the hearing distance is sufficiently good for the ordinary conversational and business or professional necessities, the slight beginnings of deafness pass unheeded and undetected. With difficulty it is that we can at times persuade a patient that the hearing power is not as good in one or both ears as it might be. Particularly is this the case when we are consulted for tinnitus without any considerable impairment in the hearing. The persistence of the noise, of whatever kind it be, is the first warning of the future decadence which follows the early perversion of the function. Just as we should never neglect occasional or persistent pain in the ear, so should we always be mindful that tinnitus is a warning symptom, not alone of local auditory derangement, but frequently is it the danger signal of more remote mischief in the brain, heart, or general vascular system. But of tinnitus aurium I shall have more to say. Of the patients asked if they could ascribe any cause for the trouble for which they sought relief, I have only recorded the answers of those who appeared certain that there

were good grounds for attributing it to some diathesis, illness, accident, habit, or occupation.

Scarlatina .....	45
Cold (principally naso-pharyngeal catarrh) .....	36
Hereditary (father or mother deaf in fifteen cases) .....	24
Injuries and foreign bodies .....	21
Sea-bathing .....	13
Measles.....	11
Uterine functional disorders.....	9
Neuralgia.....	8
Syphilis .....	8
Anæmia .....	8
Cardiac disease .....	8
Fever.....	6
Gout .....	5
Congenital .....	5
Tropical or climatic .....	5
Alcoholic excess.....	4
Ozena .....	4
Gun practice .....	3
Mental worry and shock .....	3
Puerperal .....	3
Diphtheria .....	2
Nasal polypus .....	2
Rheumatism.....	2
Struma .....	2

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I have already shown that 92 patients had cerumen in the external meatus, and that 88 suffered from various throat and naso-pharyngeal affections.

Some deductions from this table of the causation of aural diseases may be drawn. It will be noticed that *scarlatina* was directly or indirectly the source of the affection in nearly one-fifth of the cases. A very large proportion of these patients had perforation of the drum-head in one or both ears. Several suffered from acute suppurative inflammation during the illness; in others the perforation or catarrhal state was secondary to the exanthem. From this at least we learn the practical lesson of the paramount importance of close attention to the ear during the scarlatinous fever and the period of desquamation, seeing how frequently an affection of the ear, often producing total deafness by destruction of the tympanic membrane or the ossicles, is one of the sequelæ. Here, if the

practitioner has not the necessary skill to puncture, at the right moment, with a fine lance-head knife or myringotome, a bulging pocket of the membrane, or that he finds it difficult, from the age of the patient, to carry out this step, close attention to the cleanliness of the external meatus and the naso-pharyngeal tract will do much to limit mischief and prevent destructive suppuration in the auditory passages. I shall, in dealing with general therapeutical principles, again refer to the prophylaxis of scarlatinous inflammation in the naso-pharynx and auditory passages. Next on the list we find *cold caught* the most frequent source of trouble. That recurrent and troublesome visitor, "a cold in the head," with its attendant coryza, being the attack principally referred to. No doubt frequent catarrhs both of nose and throat are the common cause of catarrhal conditions of the membrane and drum cavity.

The temporary swelling and closure of the Eustachian tube with the consequent interruption in its valvular function, independently of the imprisonment of secretion in the tympanic cavity, is a sufficient explanation of this result. The delicate Eustachian, as well as the intrinsic tympanic muscles, are included in the inflammatory process, so that the temporary atonic state is frequently succeeded by a prolonged, if not permanent, enervation. The recurrence of attacks increases the danger and brings on the periodical deafness or slight dulness of hearing. The intermittent hum or buzz of tinnitus becomes in time a permanent defect, and there is a constant tinnitus. Thus each catarrhal attack is remarked by the patient to favour the symptoms of deafness and noise in the ear, but as these subside little attention is paid to them until the permanent deafness necessitates advice. The same observations apply to attacks of tonsilitis, and so we find the ordinary "sore throat" a frequent precursor of aural mischief. Draughty places, exposure to cold air and a keen wind, rapid changes of temperature, carelessness after exercise and chill, are the occasional causes of abscess or myringitis. Nor is the relation of pharyngeal inflammation and tonsilitis to miasmatic or septic surroundings to be forgotten in the etiological consideration of external and middle-ear catarrhal inflammation. The same impure atmospheric or contagious influences operate in both

instances. And it must frequently happen that these prevalent zymotic conditions accentuate the aural as they do the throat trouble; or it may be that under the favouring conditions of confinement in the limited space of the Eustachian tube and tympanic cavity, with the increase of temperature and the accompanying moisture, fermentative changes are here more readily induced, as we know they are from similar causes operating in the external ear passage in the instance of furuncle.

Again, we may derive a valuable therapeutic lesson from these facts. We should attend closely to the ventilation of the aural passages and cavities during these catarrhal states. At the same time the faucial orifices of the Eustachian tube should be kept patent. Patients should have impressed on them the danger arising from recurrences. Warmth of the extremities should be insisted on. The feet should be kept warm and free from damp. "Colds in the head" should be cut as short as possible, and the throat and nasal passages should be seen to when the cold has passed over. Antiseptic, alkaline, and astringent agents may be combined in vapour, spray, and gargle, and the frequently existing atonic muscular state can be counteracted by change of air, local astringents, and general tonics. Most necessary is it to warn patients of the slow and imperceptible advance of this catarrhal deafness. Free inflation of the ear and attention to the nose and throat, in the manner hereafter to be described, would save the hearing of many an ear and much of subsequent useless interference if resorted to early.

That deafness is one of those ailments which nature entails as a *hereditary* reminder of parental imperfection is well known, and in it frequently we have a good exemplification of the law of atavism; the defect appears to skip one generation, and to reappear in the next. Occasionally, though we cannot find evidence of deafness in the parents, curiously enough two or three brothers or sisters are affected. The deafness at other times will be found at the father's or mother's side, while the parents have escaped. Such hereditary deafness is nearly always of a most unfavourable type, and treatment generally ends in a negative result. In a great many cases the physician does not see the patient until the deafness is far advanced and

there is evidence of serious middle and internal ear trouble. The lesson, obviously, that we may gather, is, to attend, in all such families, to any early indication of approaching mischief and to lessen the chances of it by looking after the throat and tonsils and any nasal obstruction or abnormality which may exist in childhood. For it is the fact, and a most vital one in regard to this form of deafness, that we frequently find it first make its appearance after puberty, or even later on.

Rupture of the drum-head, extravasation of blood into the cavity of the tympanum or the internal ear, with some lesion of the nervous structure, are a few of the consequences of *injuries* to the ear—blows, falls, explosions, &c. It would be well to impress this fact on all parents and school teachers. The physiological principle of rest is our best remedy here.

I have elsewhere given my reasons, anatomical and clinical, for insisting on the use of the syringe alone in the removal of *foreign bodies* from the ear. There are some exceptions to this rule: they are so few they but serve to establish its soundness. This is also the generally expressed view of the most experienced aurists. Occasionally we find a foreign body fixed in the meatus, or its shape precludes the possibility of removal or the disturbance of its position by syringing. Again, it may be of such a nature and shape that we can quite readily seize it with a forceps and remove it; take, for example, such a substance as a small piece of sponge or stick. If a foreign body is jammed in the meatus, it has generally become so from the imprudent efforts at extraction. Especially in inexperienced hands is it more likely to be pushed further in by such attempts than removed. Or inflammation may have occurred in the meatus and in the membrane of the middle ear. The consequent swelling has complicated matters, and makes the necessity for caution all the greater. In hospital practice we see, I think, proportionately, more cases of foreign bodies lodged in the meatus than in our private work. Looking back on all the instances in which other attempts than by syringing have been tried and failed, on all the different varieties of tenants that I have myself evicted, on the mischief I have seen done by the rashness engendered of failure, on the success which, if we have only patience, as a rule, attends on properly directed syringing, I would say, "In the removal of

foreign bodies from the ear resort to syringing alone ; have patience and wait. Repeat the syringing in different positions of the head, and sometimes when you least expect it the unwelcome visitor will drop into your spout. Take any form of extractor, no matter how ingeniously devised, in your hand only when the nature of the substance justifies your belief that you can lay hold of it or that by its position you can gently raise it from its bed." I speak thus from an experience derived from the removal of a great variety of foreign bodies, and such difficult ones to abstract as glass beads of different shapes, pieces of toy jewellery, stones, slate pencils, shells of different kinds, portions of chalk, &c. I have had occasionally in the instance of children to administer an anæsthetic, and it is better to do this than make the child nervous or run the risk of injuring the ear through the little sufferer's unsteadiness during attempts to extract. I have succeeded with snare, forceps, spoon, the double wire (Mr. Jonathan Hutchinson) in such cases as those mentioned. They were, however, the rare exceptions. Most of the serious consequences I have known, even to the tearing away of the membrane in mistake for the top of a programme pencil, which had come off in the meatus, but which had subsequently dropped out, have followed such attempts to get away the body. It tries the patience both of relatives and surgeon this waiting and syringing. Friends get uneasy. But this should not tempt us to rashness. On several occasions, after intervals varying from a week to a month, I have known a foreign substance come away with syringing, and do the ear no ultimate hurt.

A curious case of prolonged tenancy has lately come under my notice. A lady, aged twenty-two, had when a child put some grains of No. 5 shot in her right ear. She never had these removed, and their existence was overlooked and the act forgotten. No pain or uneasiness followed. Some time before I saw her she was told she had wax in the ear, and in the act of syringing, a surgeon removed a grain. It was then thought that all was right. Feeling the ear still uneasy, and some tinnitus remaining which did not yield to syringing, she was brought by a medical friend to me. I thought I had impacted cerumen to deal with, seeing some hard wax at the bottom of the meatus. On removal of this, however, I thought I dis-

cerned something in the nature of a foreign body. I persevered in the syringing, and, surrounded by a layer of wax and epithelium, out came another grain of shot, which had snugly lain there all these years. I saw this lady about one month afterwards. The membrane was normal in appearance, and the hearing distance perfectly restored.

It is well to draw attention to *sea-bathing* as a cause of deafness and catarrhal attacks of the tympanum, and, as I have seen in some instances, perforation of the membrane. This is more apt to happen from diving on the head. The strong salt water finds its way into the tympanum, causing catarrhal inflammation. On the whole, it is well to advise patients with perforation of the membrane and aural catarrh to avoid sea-bathing, or desire them to protect the meatus when in the water with some aural protector, as that of Dr. Ward Cousins, or with cotton wool, and not to get the head under water or to dive. *Measles* is not without its risk of impairing the hearing. I have found that catarrhal states of the tympanum, with some collapse of the Eustachian tube, are the conditions we most commonly find as sequelæ of measles. The coryza and nasal catarrh, with the attendant swelling of the naso-pharyngeal mucous membrane, account for this result. The same precautions which are indicated during convalescence in the case of scarlatina are required after measles. A little care and watching are sufficient to prevent any permanent injury. In a comparatively small number the deafness and tinnitus were associated with *menstrual irregularities*, as amenorrhœa, with attendant anaemia and neuralgic conditions, the menopause, or the menorrhagia of sub-involution.

Notice the equally small proportion of cases in which syphilis could be said to play a direct part in producing the ear affection. These eight patients had had severe primary syphilis, and the deafness arose as one of the secondary and tertiary symptoms of the exanthem. But of those who suffered from naso-pharyngeal trouble only a small proportion had post-nasal catarrh and congenital evidences of inherited syphilis in the teeth and cornea. More frequently have I seen such cases in the hospital clinique. The presence or reminiscences of interstitial keratitis, the characteristic teeth, the nasal speech, the post-nasal affection,

are clear evidences of the inherited taint. While the deafness of acquired syphilis more frequently yields to specific treatment, that of the transmitted kind is peculiarly hopeless. I can only repeat the caution I gave in referring to inherited syphilitic taint in the case of the eye, viz., to treat its earliest indications by a specific course. In addition to this, in the instance of the ear, much may be achieved by close attention to the nasopharynx and Eustachian tubes.

*Anæmic conditions* of the blood often attended by *neuralgia* are responsible for that tinnitus which I think we may truly call anæmic tinnitus, at the same time that there is induced a general state of enervation of the tubal muscles and consequent intra-tympanic changes, with corresponding alteration in the shape and tension of the membrana tympani. These are typically the cases which do well with change of air, a trip to St. Moritz, or some mountain health resort in the Upper Engadine, or, if this cannot be afforded, any of our elevated home sanitaria. At times a stay at the sea-side will charm away these anæmic noises. It is well with this change to combine a course of arsenic and iron, with perhaps quinine and nux vomica. It is in such persons that we occasionally find a vascular tinnitus ascribed to mental overwork and worry. It is in these mentally overworked patients that alternations in the tension of the tympanic vessels, whether it be excess or diminution, bring about tinnitus and ultimately deafness from the combined causes, vascular disturbance and irregularity of the blood supply, and enervated muscles.

Perhaps there is a further cause for the tinnitus and disturbance of tension in some *cardiac lesion* which is present. A tinnitus which we cannot readily account for by the local physical signs should always prompt us to examine the heart carefully, as in a mitral or aortic murmur we may find the solution of the mystery. The proportion of *fever* patients, I allude more particularly to typhus and typhoid, in whom any permanent aural lesion remains after the fever, is insignificant if we compare the number of those attacked with even severe fever with the cases of deafness arising therefrom. I only record eight cases out of those I have classified who attributed their deafness to any form of fever. I speak also from a large

public dispensary experience, and eleven years of work in a fever hospital—in which we treated yearly an average of some five or six hundred cases of fever—and from a personal conduct of some 2,500 cases of fever of different kinds. It is the rule for the temporary deafness which accompanies a severe fever to pass off when the attack subsides and the patient is convalescent.

*Gout* also has had, amongst its other universal attributes, the power of causing deafness commonly attributed to it. *Gout* furnishes one of those familiar explanations for anything or everything with a certain class of patient, and, where hard pressed, it is the forlorn hope that ignorance gladly falls back on, and which fashionable empiricism is ever ready to bring forward as a cause for most of the ills that flesh is heir to. No doubt I have seen many instances of morbid changes in the ears of gouty patients, and in those of members of gouty families, who did not themselves suffer from gout. But I do mean to say that gout as a cause of deafness, exostosis, and other morbid changes in the auditory apparatus, is greatly exaggerated. Tinnitus and deafness, with catarrhal changes, are occasionally induced by a *residence in India* and elsewhere in the tropics. These are not favourable cases to treat. The tinnitus is particularly distressing and intractable. Frequently there is a catarrhal state of the membrane and tympanum, or an old closure of the Eustachian tube, accompanying it. There is generally evidence of auditory nerve impairment. For those in the services who are obliged to be present at *gun practice*, the sound deadeners of Dr. Ward Cousins will be found of use to prevent the effects of the concussion. I have had convenient little celluloid ear protectors made for the same purpose by Messrs. Maw, Son, and Thompson. They serve as protectors for the meatus after syringing. I have them perforated so as not to encourage a vacuum in the meatus. They are made of different sizes, and are not objectionable to wear. They protect from cold and draught. Finally, I would draw particular attention to the fact, lately commented on by Löwenberg, that out of the entire number of cases only two suffered from nasal polypus and four from ozæna.

## THE TREATMENT OF PNEUMONIA BY QUININE.

BY F. P. ATKINSON, M.D.

IF the Collective Investigation Committee of the British Medical Association have done no other good, they have certainly directed attention to the treatment of pneumonia by quinine, which is destined, I think, sooner or later, to supersede all methods now in vogue. There can be no question that in almost every case (and I think there are very few exceptions) it prevents the disease advancing beyond the first stage, and rapidly causes resolution to take place. It does away with the necessity for poulticing, all that is required being the application of cotton wool to the front and back of the chest. My friend, Mr. Corbett, who has a good series of charts to bring forward, tells me it is equally successful in cases arising in young infants as it is in adult cases, and he asserts that many children he has been able to pull through, who, in old times, would certainly have been lost. He gives an adult two grains every two, three, or four hours, according to the severity of the case, combined with hydrobromic acid, and if there is any delirium a few drops of tincture of digitalis. If there is any large deposit of urates in the water he gives some citrate of potassium alternately with the quinine. This method of treatment I have followed out with decided benefit to my patients and satisfaction to myself. Now any one who has given repeated doses of quinine to a patient will, no doubt, have noticed the profuse sweating that occurs after its administration, and I am anxious to find out as to whether quinine really acts curatively through the perspiration it produces, its antiseptic action, or both? In some cases of menorrhagia it exerts a very decided influence upon the muscular tissue of the uterus; has it any influence upon the muscular coat of the arteries in pneumonia? An answer to these questions would, no doubt, help us not only in the treatment of pneumonia, but also many other febrile diseases.

## ON THE TREATMENT OF CASES OF IMPERFECT AND PAINFUL SWALLOWING.

BY J. F. BULLAR, M.B. CANTAB., F.R.C.S. ENG.

THE method of feeding by means of a tube passed through the nose into the stomach is well known but, so far as I am aware, is not used in the class of cases for which it is recommended in the present paper. Since the beginning of the year, cases of tracheotomy, diphtheritic paralysis, meningitis, and a case of cerebral embolism have been treated in this way in Dr. Andrew's wards at St. Bartholomew's Hospital with satisfactory results, and Dr. Andrew has kindly allowed me to publish an abstract of some cases which occurred while I was acting as his house physician last January, February, and March. During this period there were three cases of tracheotomy. In the first case the treatment was not adopted, there being no special indication for it ; the child died of pneumonia on the eighth day after the operation. The next two cases were fed by the tube, and recovered ; and it was the impression of all who watched them that if they had been fed in the ordinary way they would have died. Before describing the cases I may point out the objects which tube-feeding is intended to secure.

After the operation of tracheotomy there is often great difficulty in getting the patient to take sufficient nourishment. The pain caused by the movements of swallowing makes children refuse food which they are quite able to digest, and thus they are apt to be half-starved at a time when it is essential that they should be well nourished. They will not take more than a few spoonfuls at a time and their rest is seriously interfered with by the constant attempts to feed them which are necessary in order

to keep them alive. A more serious and also a common occurrence, is that fluids pass into the larynx and so into the lungs, where they set up bronchitis and pneumonia; after each attempt to swallow the child coughs and some fluid returns through the tube showing that it has passed into the trachea. These difficulties may be avoided by means of feeding through the nose with an indiarubber catheter and a syringe. A No. 4 india-rubber catheter, well anointed with vaseline, can easily be passed through the nose of quite a small child into the stomach, and through it liquid food may be injected in sufficient quantity to render the repetition of the performance unnecessary for some hours. By this means we can insure that no food passes into the air passages, that the child receives as much as it can digest, and that the intervals between feeding are sufficiently long to allow of several hours' uninterrupted sleep. We also know exactly how much the child has taken in a given time—a calculation which is very difficult in spoon-feeding, where so much is unavoidably spilt and spluttered up.

This method of feeding is also applicable in cases of diphtheritic paralysis and diphtheria, in fact, in all cases in which there is danger of food passing through the larynx, or in which the pain of swallowing is so great as to interfere with the proper nourishment of the patient.

It may be thought that to thrust a catheter through the nose of a small child is a barbarous practice, and that it would cause so much struggling and exhaustion as to do more harm than good. As a matter of fact, however, there was commonly little, if any struggling or apparent discomfort; the children often hardly woke while the tube was passed, and fell asleep immediately after it was withdrawn; and in cases in which the children resisted the passage of the tube it was invariably found that they had more rest and were less exhausted than when constantly troubled with a spoon.

The first case in which the treatment was tried was the following:—

CASE I.—James Andrew Chapman, æt. 2 $\frac{1}{4}$ , admitted to Mark Ward, February 18, 1885.

The child had been apparently quite well on the previous day, but in the evening its breathing became difficult, and it was

brought to the surgery at 8 A.M. in a state of urgent dyspnœa, with great recession at the lower end of the sternum.

Tracheotomy was performed at once by Mr. Lewis with great relief; no membrane was seen.

The child took food well until the 22nd. It then began to take badly, and nutritive enemata were given and retained. On the 23rd the child took better. On the 26th the food was noticed to come back through the tracheotomy tube. All feeding by the mouth was given up at once, and the child was fed entirely by a catheter passed through the nose. Half a pint of milk, half an egg, and two teaspoonfuls of brandy were given every six hours.

There was no difficulty in passing a No. 4 indiarubber catheter, and the sister was able to feed the child so easily that he scarcely woke, and he always fell asleep as soon as his stomach was full.

On March 10, the tracheotomy tube was removed, and the wound soon closed; but it was found on trial that liquids still passed into the trachea when he was allowed to drink. The nasal feeding was therefore continued until March 12, when he was able to eat and drink properly. He left the hospital well, but has since died of pulmonary tuberculosis.

CASE II.—Sydney Harold, æt. 15 months, admitted to Hope Ward, March 16, 1885.

The child had suffered from hooping-cough when three months old and a cough ever since. On the evening of March 15th its breathing became difficult, and it was brought to the surgery at 6 A.M. At this time both expiration and inspiration were impeded. There was considerable recession above the clavicles and at the lower part of the chest, and diphtheritic membrane was seen on the tonsils. Two other children in the same house were ill at the time with sore throats. At 11 A.M., as the child would not drink, it was fed through the nose with milk.

A 1 P.M. recession had become greater and the lips more blue. Tracheotomy was performed by Mr. Lewis; a small piece of membrane was coughed up. After the operation the child did not take at all well, and was fed every four hours with the tube, and this method of feeding was continued until April 3. During this time there was some inflammation around the wound, and the bowels acted four to six times a day. Vomiting occurred

twice only. The child took small quantities occasionally by the mouth, but so little that without the tube it must have starved.

On March 29, the tracheotomy tube was removed, and on the same day signs of consolidation at the base of the left lung were observed.

On April 3, the wound was nearly closed, and the child for the first time took sufficient food naturally. The signs at the left base gradually cleared up, and the child went on well without nasal feeding until April 12 when signs of pneumonia of the right upper lobe were observed. This attack ran a typical course. The temperature varied between  $103^{\circ}$  and  $104^{\circ}2$ , falling to normal on the eighth day.

When the attack began this child refused its food, and tube feeding was again resorted to and continued until the 19th, when the crisis occurred, and the child began to take naturally. After this the tube was only used occasionally, and at night. The child made a steady recovery, and was sent into the country on May 6.

During the last attack of pneumonia there was a little vomiting but never of the whole quantity injected.

This child was fed almost entirely by the sister and nurses of the ward and they experienced no difficulty, it soon became used to the tube and did not seem distressed by it. A few weeks ago the mother called at the hospital and the child was then alive and doing well.<sup>1</sup>

CASE III.—Paralysis after Diphtheria.—William Curzon, æt. 4, admitted to Mark Ward, March 16, 1885.

The child had a sore throat early in February and on the 24th its mother noticed that it had difficulty in swallowing. On admission there was slight facial paralysis on the right side. Fluids returned through the nose and the child choked when it attempted to swallow. Moist sounds were heard all over the chest, and the fauces and larynx were much clogged by mucus. Frequent cough and impaired resonance on right side of chest. There was no inflammation of the throat. The child was fed entirely by the tube, the mucus in the air passages diminished and the chest signs improved. On March 26, the child was able

<sup>1</sup> Since the above was written the child has been brought to the hospital: it continues well.

to drink without choking and the tube feeding was given up. He was discharged well on April 18.

In this case it is very probable that the bronchitis was set up by the food which passed down the trachea before the child came to the hospital, and that if the ordinary mode of feeding had been continued the child would have died.

In this case the child objected strongly to being fed, struggled a great deal, and succeeded more than once in coughing up the end of the catheter as it was passing through the pharynx. A very fine stilet was therefore passed down the catheter to within about an inch of the end and it could then be easily passed.

The same method of treatment was adopted in a case of diphtheria in a child aged one year and eight months, and in several cases of meningitis in which the patients were unable to swallow. These cases ended fatally, but the patients survived long enough to show that tube feeding may be persisted in for a considerable time without bad effects and that no accident is likely to occur.

The last case I shall mention is that of Catherine McCarthy aged twenty-eight, admitted to Hope Ward, February 14, 1885, having suddenly lost her consciousness on that day. She was the subject of mitral and aortic disease, and her attack was due to embolism of the right middle cerebral artery.

She had left hemiplegia and complete inability to speak or swallow. She was fed by the tube, introduced sometimes through the nose and sometimes through the mouth until the day of her death on the 20th of July. During this long period no accident happened.

I trust that the above cases are sufficient to prove that tube feeding is a perfectly safe and not inhumane process, and that the disadvantages attending it are far outweighed by the good it does.

With a tube we can place the food in the stomach with certainty, but with a spoon it is impossible not to divide it between the stomach, the lungs, and the bed. The tube allows sufficient intervals of sleep on a full stomach, but the spoon often causes wakefulness on an empty one.

## ON POISONS FORMED FROM FOOD, AND THEIR RELATION TO BILIOUSNESS AND DIARRHŒA.

BY T. LAUDER BRUNTON, M.D., F.R.S.

(*Continued from p. 200.*)

IT is quite evident that it would be unjustifiable to conclude that because alkaloids are formed by the decomposition set up by bacteria in albuminous matters outside the body, they are therefore formed constantly within the body, either in health or disease, however probable such a conclusion might be. But positive evidence that such a formation of alkaloids does occur in the intestine is afforded by the fact that alkaloids are found in the freshly voided faeces.

That alkaloids are present in the circulating blood, is shown by the fact that they are separated from it by the kidneys, and are found in the urine. The effect of ptomaines formed in the body in producing disease has been investigated by Bouchard, who has found that the poisonous activity of human faeces is very great, even when they are quite healthy, and a substance obtained from them by dialysis produces violent convulsions in rabbits. Bouchard considers that the alkaloids formed in the intestine of a healthy man in twenty-four hours would be quite sufficient to kill him if they were all absorbed and excretion stopped. When the functions of the kidneys are impaired, so that excretion is stopped, uræmia occurs: and to this condition Bouchard would give the name of stercoræmia, because he thinks it due to alkaloids absorbed from the intestines. The nervous disturbances which occur in cases of dyspepsia, and of dilatation of the stomach, he thinks are due to nothing else than poisoning by ptomaines. Lépine and Mollière describe the case of a man suffering from intestinal constriction, who suddenly became ill and died in two days with all the symptoms of atropine poisoning, redness of the skin, delirium, dryness of the throat, extreme

dilatation of the pupils with loss of reaction to light and rise of temperature. There was nothing to show that the patient had taken atropine or belladonna, and Lépine and Mollière consider that he died from ptomaines formed in the bowel and absorbed from it. They found in the contracted intestine a faecal mass having a particularly bad smell, and they think that it was the source of the poisoning.<sup>1</sup> There seems to be little doubt that the amount of ptomaines formed in the body in disease is greater than it is in health; and very probably they are of a different character, possibly varying with the disease. According to Lépine and Guérin the poisons contained in the urine in different diseases differ in their physiological action. The extract obtained from the urine in cases of typhoid produced in frogs increased reflex action and death after three hours, the heart being usually found in a state of diastole. In cases of pneumonia the urine had a similar action, except that the heart was found in a more or less contracted state, varying with the severity of the case from which the urine had been obtained. One author has gone so far as to consider that the immunity which one attack of an infective disease confers against a subsequent one, is due to alteration in the body, not by bacteria, or other low organisms, but by a chemical substance which they produce; and he has proposed to afford protection against the disease by cultivating the bacteria artificially and inoculating with the poison which they produce without the bacteria themselves. This does not seem a very promising method of treatment, but we are likely to obtain most useful information regarding the proper diet in disease, and especially in cases of intestinal disease, by observations on the nature of the poisons which bacteria produce when cultivated in different kinds of food.

This investigation has been begun by Breiger, who found that the typhoid bacillus, although it grew well in peptone, appeared to form no alkaloids from it—at least he was unable to obtain any. When he cultivated it in beef-tea, however, he obtained as a product of decomposition an exceedingly small quantity of ptomaine, which had a marked peculiarity in its action, namely, that after death from it the heart was found

<sup>1</sup> Lyon Méd., No. 42, 1884.

<sup>2</sup> Lyon Méd., No. 24, 1884.

constantly in a state of systolic contraction, whereas most of the other alkaloids obtained from putrefying substances, such as muscarine, tend to produce stoppage of the heart in diastole. This alkaloid when given to guinea-pigs caused slight salivation and increased rapidity of respiration ; later on the animals lost control of the muscles of the extremities and trunk, although there was no definite paralysis of the muscles themselves. The pupils became dilated and no longer reacted to light, salivation was profuse, and there was constant diarrhoea ; the respiration and pulse became slower, but sometimes the animals did not die until after twenty-four or forty-eight hours. On *post-mortem* examination, in addition to the systolic contraction of the heart already mentioned, hyperæmia of the lungs was found, but the other organs were pale. The intestines were firmly contracted, and their walls were pale. Most of the alkaloids which have been obtained by the decomposition of albumen appear to belong to the muscarine type, and to have a tendency to cause diarrhoea, although some appear to belong rather to the atropine type, which, to a certain extent, counteracts the effects of muscarine.

No alkaloid having a well characterised chemical formula appears as yet to have been isolated from cholera stools, but Nicati and Rietsch<sup>1</sup> have produced choleraic symptoms in animals by cultivations of the comma bacillus from which the bacilli themselves had been removed ; and somewhat similar results were obtained several years ago by Lewis and Douglas Cunningham with cholera stools in which any organisms present had been destroyed by boiling. In view of the extraordinary activity of some of those alkaloids, we cannot wonder at the violent symptoms which sometimes occur after the use of tainted meat, nor even at the extraordinary poisonous action of eggs in some persons. It is probable that the diarrhoea and vomiting which are produced by tainted meat, are due to the poison formed from the albuminous substance of the meat, by low organisms, either before it has been consumed, or by decomposition in the intestinal canal itself. In most persons eggs are harmless, but the yolk of eggs contains, in considerable quantity, lecithin from which choline may be readily formed ; and if we suppose that

<sup>1</sup> *Compt. rend.*, xc. 928.

in certain individuals choline, or perhaps even muscarine, is formed from eggs during digestion, we can readily see why this useful article of diet should prove to such persons a violent poison. It is more difficult to say why milk should, in some persons, prove poisonous. Milk also contains lecithin, but in small quantity; and all we can say about it at present is that, in some individuals, a poison is probably formed from it, which causes it to disagree.

But even when milk and eggs do not cause any immediate disturbance of the digestive functions, they sometimes produce, when taken for several days together, a condition which is generally termed biliousness. It is rather hard to define this condition, inasmuch as the term is an elastic one and includes a number of symptoms. Amongst them may be said to be a tendency to eructation and acidity with an appetite which sometimes is very good, sometimes is bad, and sometimes is capricious. These symptoms may depend upon the condition of the stomach itself, but they may also be due to derangement of the liver, for all the venous blood from the stomach must pass through the liver on its way to the general circulation, and any obstruction to the hepatic circulation will produce venous congestion of the stomach and consequent disturbance of its functions. But these symptoms are not unfrequently accompanied, or succeeded after an interval of a day or two, by others which point more distinctly to the liver itself, such as slight frontal headache, a sallowness of complexion, a faint yellowish tinge of the conjunctiva, and a bitter taste in the mouth. These are usually attributed to the presence of biliary matters in the blood, the colour of the face and conjunctiva being attributed to bile pigment, and the bitter taste in the mouth to bile acids. But bile acids are not so very bitter—they are rather bitter-sweet, and healthy bile has no bitter taste, so that it seems that the bitterness in the mouth may, with more probability, be attributed to some alkaloid circulating in the blood, and excreted by the salivary glands. Along with this condition we sometimes find that the stools are pale, and then the explanation of the symptoms is easy, for we at once conclude that there is a catarrhal condition of the stomach and duodenum, and that the swollen mucous membrane presents a mechanical obstacle to the

flow of bile from the liver. The pressure of bile in the biliary passages is thus increased, and absorption occurs. This explanation seems so satisfactory that we hardly care to look for another. But it is quite possible that it is not the true one. The real cause may be that the bile has become so viscid that it will not flow through the ducts, and even when the tendency to secrete such thick bile has passed away, the viscid bile already formed may plug the ducts and cause the jaundice to continue, even though the mucous membrane of the ducts and duodenum should be healthy. Moreover, we sometimes find that instead of the stools being paler than usual they are darker than usual, and it seems rather hard to say why we should have more bile than usual passing out into the intestine, and at the same time have bile absorbed into the blood. But here we gain much information from observations on the action of poisons. Schmiedeberg noticed that toluylendiamine, a substance belonging to the aromatic series, produced jaundice; and the action of this substance has been further investigated by Stadelmann. Their observations show that this poison causes increased destruction of blood corpuscles in the liver, with increased formation of bile. At first all the constituents of the bile, both the solids and the water, are increased, so that a greater quantity of bile is secreted; but as the action of the poison goes on the solids are excreted in greater quantity than the water: and so along with a great increase in the biliary solids secreted, the bile itself becomes more and more viscid, until at length it will not flow through the bile ducts, and thus absorption and jaundice takes place—although there is no mechanical obstacle to the passage of the bile into the duodenum. The first stage of the action of this poison corresponds to the condition of biliousness with excess of bile in the stools. It is possible that the second stage may correspond to so-called catarrhal jaundice, especially in epidemics, though it is also possible that the usual explanation of the causation of catarrhal jaundice may be in many cases the correct one.

It is probable that other bodies belonging to the aromatic series have also a considerable action on the biliary secretion, for salicylate of sodium is a powerful hepatic stimulant, greatly increasing the secretion of bile. Unlike toluylendiamine, however, it greatly increases the water of the bile, and renders it thinner instead of

more viscid. We do not as yet know what the action of the aromatic compounds formed in the intestine is upon the secretion of bile, but we know that a number of aromatic compounds are formed in the body and are excreted in the urine. These bodies are formed both in health and disease, and carbolic acid occurs in the urine of healthy men. It becomes much increased when the peristaltic movements of the intestine are interfered with;<sup>1</sup> and occurs also in much larger quantity than normally in some cases of infective disease, such as diphtheria, facial erysipelas, pyæmia, and scarlet fever.<sup>2</sup> So far as I know tolulylendiamine has not been obtained as a product of albuminous decomposition; but another substance having, like it, the power of producing intense jaundice has been got from lupin seeds. Sheep fed upon these seeds frequently die, and one of the most marked symptoms is intense jaundice. From these seeds Kühn<sup>3</sup> extracted a substance to which he gave the name of ictogen; and this substance has been further purified by Arnold and Schneidemühl, who give it the name of lupintoxin. It does not appear to be an alkaloid, but rather a substance of an acid nature, but what its exact chemical nature is has, so far as I know, not been exactly ascertained.

Along with biliousness we frequently find headache, and many severe headaches associated with vomiting are popularly known as bilious headaches. Modern pathology is inclined to regard the so-called bilious headaches as rather of nervous than of hepatic origin, and no doubt they frequently originate in mental conditions such as worry, or overwork, and also in defective vision. Still, we are but very imperfectly acquainted with the links which connect excessive worry with pain in the head and vomiting: and it is I think probable that here, as in many other cases, popular opinion is based to a certain extent upon truth. Lately during the epidemic of cholera in Spain we have heard the same cry raised as in the Middle Ages, that the wells were poisoned, and the popular belief of the Middle Ages coincides with the results of modern scientific research in pointing to contaminated water as the source of disease,

<sup>1</sup> Salkowski und Leube, *Lehre vom Harn*, p. 143.

<sup>2</sup> Brieger, *Weitere Untersuchungen über Plomaine*, p. 70.

<sup>3</sup> Quoted by Kobert, *Schmidt's Jahrb.* 1884, cciv. p. 13.

although the poisoning is due to the ignorance or carelessness which allows sewage to enter the wells, and not to the direct introduction of poison by design. Similarly popular belief in regard to headaches is, I think, not entirely mistaken in giving to them the term "biliary," for while they may originate in the central nervous system, the liver may play a not unimportant part in their actual production. In the case of a lady who consulted me a short time ago, I was a good deal struck by her observation, that she was always better after the vomiting although she brought up no bile whatever, and she was puzzled to know how the mere action of vomiting could do good. Her observation to a certain extent corresponds with my own experience, and I am inclined to believe that the relief experienced after the vomiting may be due, in part at least, to the emptying of the gall-ducts by the compression which the liver undergoes between the diaphragm and the abdominal walls in the act of emesis. The pressure under which bile is secreted is normally very low, and it is easy to see that if the bile should from any reason be more viscid than usual, mechanical pressure would be exceedingly useful, by tending to press the viscid bile, along with any alkaloid it may contain, out of the liver into the duodenum, and thus to prevent its re-absorption.

I do not mean to accuse the bile of being the primary factor in the production of biliary headache. I should be inclined to look upon it more as an accessory, and to attribute the symptoms rather to the presence in the bile of some alkaloidal substance which, on passing into the general circulation, gives rise to vascular disturbance and headache.

We must look to further observations upon the nature of the alkaloids formed by putrefaction; upon the effect of typhoid and other bacilli, on milk, eggs, beef-tea, and other foods used in typhoid fever, to a more exact investigation of the alkaloids formed in the intestine and found in the faeces and urine, and to experiment upon the action of aromatic substances formed in the intestine upon the liver, for further knowledge which may aid us in treating disease; but enough has been already done to show what important effects on the animal body are in all probability produced by the alkaloidal products of albuminous decomposition.

# ON THE PHARMACOLOGICAL ACTION AND THERAPEUTIC APPLICATION OF SOME ETHEREAL SALTS OF CARBAMIC ACID.

BY O. SCHMIEDEBERG.

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THE ethereal salts which carbamic acid forms with radicals belonging to the fatty series of organic bodies have a double interest from a pharmacological point of view. On the one hand, a study of their actions is calculated to enlarge considerably our theoretical knowledge regarding the alcohol-group of bodies, which is of great pharmacological importance, and on the other hand, the practical question at once arises of the therapeutical application of these substances.

The following researches, which were undertaken with these objects in view, are intended to form only the starting-point for further investigations, some of them more comprehensive in their scope and others more devoted to detail.

## I. *Theoretical Considerations regarding the Pharmacological Group of Alcohol.*

To this group belong all the numberless compounds of the fatty series having a narcotic action. In the slighter degrees of their action these bodies first of all produce a condition of diminished excitability and depressed functional activity in various parts of the brain, and especially produce in them a greater or less degree of insensibility to external stimuli.

As their action increases, the functions of the cerebrum, and especially sensation and consciousness, become more and more depressed and finally completely abolished (narcosis); reflex excitability is gradually destroyed, the origins of the nerves for

the various vascular districts, and of other organs, are deprived of their tone, and finally the respiratory movements are arrested through paralysis of the corresponding nerve-centres. Simultaneously with these effects there are developed an enfeeblement of the heart, due to an analogous paralysing action on the cardiac ganglia, and other phenomena which are partly accidental and partly secondary, but which all of them belong to the typical course of the poisoning. The deviations from the typical action which occur in the case of individual substances, except when special atomic groups enter into their composition, consist essentially in the fact that certain organs, and especially the vaso-motor centres, are affected earlier and more powerfully by one compound, and later and more feebly by another. The fundamental character of the action, however, remains the same in all these cases.

We are even now able to obtain some definite and comprehensive views regarding the activity of saturated compounds of the fatty series, and regarding the conditions relating to deviations from the fundamental character of the action.

The *activity* of a substance, in regard to absolute amount, depends before everything else on the readiness with which the substance is absorbed. Its *absorability* is determined by its solubility in water, or, when this is absent, by the readiness with which it volatilises at ordinary temperatures. For example, while the volatile hydrocarbons of petroleum exhibit the action of the group to its full extent, the paraffin oils which are both insoluble in water and non-volatile, as well as the solid paraffins, are completely inactive.

The extent to which the action of a substance resembles in its *nature* the typical action of the alcohol group is determined essentially by the *number of oxygen atoms which its molecule contains*. A precise law on this point cannot be definitely formulated at present, but we may with tolerable certainty lay down the rule that all compounds which contain two or more atoms of oxygen in one hydrocarbon group no longer belong to this group. The only doubt which can be entertained is in regard to the glycols, which have not yet been fully investigated, and at all events they stand just on the border-line of activity.

When a compound is composed of several independent hydrocarbon groups it is active, provided that at least one of them contains no oxygen at all, or not more than one atom of oxygen. Amongst the polymerised aldehyds, we may regard paraldehyd as a compound, the molecule of which is composed of three similar parts, to each of which one atom of oxygen is loosely attached, and each of which plays an independent part in the pharmacological action.

Ethereal salts, for example, acetic ether or oxalic ether, are also composed of two or more parts, but in this case the parts are not equal in importance. The active part in them is the hydrocarbon group, while the acid is either of no importance at all or plays a part entirely different from that of the hydrocarbon group. Ethereal salts therefore belong to the following category of compounds, which along with a typically acting hydrocarbon, contain other organic or inorganic atomic groups, and which exhibit in their actions many peculiar relationships, very important for a pharmacological system, but which can be only partially surveyed at present.

In regard to the action of such substances we may recognise in a general way, and with a certain amount of reserve, the following cases of conformity to law.

(1) Extremely poisonous groups of atoms lose both the intensity and the original character of their action through substitution by the hydrocarbons of the fatty series. This behaviour is exhibited both by nitriles and iso-nitriles, the former of which are to be regarded as direct substitution products of hydrocyanic acid. It is only when hydrocyanic acid is formed by dissociation in the body that the corresponding action occurs.

Oxide of cacodyl  $[\text{As}(\text{CH}_3)_2 - \text{O} - \text{As}(\text{CH}_3)_2]$  may be supposed to be formed from arsenious anhydride by the substitution of  $(\text{CH}_3)_2$  in place of each single atom of oxygen removed. It produces no arsenical action on the organism. An arsenical action only appears after the compound has undergone decomposition in the organism. Lead-triethyl and zinc-triethyl behave in a similar manner, and probably all other analogous compounds do the same.

(2) Conversely, the activity of the hydrocarbon group may

be weakened or completely abolished by combination with other atoms or atomic groupings. An example of this is afforded by the ammonium bases of the fatty series. The action of these bases, *e.g.* of methylamine, of dimethylamine and trimethylamine has the same fundamental character as that of ammonia. They produce no narcosis.

(3) When the compound is composed, as in ethers and ethereal salts, of two atomic groups united by oxygen, the action of the whole molecule depends, so far as our view of the matter extends at present, on the nature and constitution of both components, inasmuch as each of them plays an independent part. If both components consist of hydrocarbons similar to one another in kind or in valency, as is the case in simple and in compound ethers, the action of the whole compound is that of a unit, and it belongs pharmacologically to the typical members of the alcohol group. Hereto belong these ethereal salts in which the acid by itself, *i.e.* when neutralised especially by sodium, has no specific action. Acetic ether and its homologues are consequently to be classed in the alcohol group.

On the other hand, when the acid in such compounds is itself poisonous or exhibits in any way a peculiar relationship to the organism, its properties manifest themselves also in its ethereal salts, and cause them to deviate considerably in their action from the fundamental character of the alcohol group. Amongst such compounds we may especially remark the ethereal salt of amyl and nitrous acid, usually called nitrite of amyl, in which the actions of nitrous acid are combined with those of amyl. Beyond this there are but few facts to be considered here, and we cannot decide how far a splitting-up of the ethereal salts in the organism comes into consideration in their action.

Etheral salts of carbamic acid belong to this class, and are likewise composed of parts differing in their nature. It appeared probable, *a priori*, that in them the hydrocarbon group of the fatty series would retain its original kind of action ; that further the group CO, as radical of carbonic acid, can play no essential part in the behaviour of the compound ; and that the group NH<sub>2</sub>, if it does anything at all, must influence the functions of the nerve-centres in the medulla oblongata in the same way as ammonium bases.

These were the general pharmacological views which led to an investigation of the actions of these peculiar compounds.

## II. *On the Action of Urethane and of some other ethereal Salts of Carbamic Acid.*

Only those ethereal salts of this acid which are readily soluble in water were considered, because those salts only could exhibit the mode of action clearly and uncomplicated by difficulties of absorption. With the exception of the compounds in which the group  $\text{NH}_2$  has been substituted, the ethereal salts of methyl and ethyl are the only ones which completely correspond to these requirements, the salts of propyl being not quite soluble and those of the higher members of the fatty series being almost insoluble in water. On this account the ethyl salt, or urethane, forms the central point in the present investigation.

The urethane was prepared almost exclusively from commercial ethyl-chlorocarbonate. This was converted in the ordinary way, by aqueous solution of ammonia, into ethyl-carbamate. This was removed from the neutralised watery fluid by shaking with ether, which was washed with water and distilled off. The urethane which remained in the retort after the complete distillation of the water was distilled *in vacuo*. The solidified mass was then broken into small pieces and dried completely over sulphuric acid.

The strength of the solutions employed in experiments on animals was from 10 to 25 per cent.

*Action of Urethane on Frogs.*—Doses under ten milligrammes have no perceptible action. Even after doses of ten to twenty milligrammes the animals appear but little affected. It is only after doses of twenty to thirty milligrammes that marked effects are produced. These are, however, not always perceptible at once, for the animals appear perfectly normal so long as they are quiet. They retain their usual sitting position, breathe briskly, and are induced by slight external occurrences to make powerful and perfectly co-ordinated movements and jumps. They can now, however, be hypnotised much more easily than normal frogs, remain in every position and posture into which they are put, and in the more marked degrees of this stage of action it is difficult to get them out of any position which has once been

assumed, without external assistance. We have here to do then purely with a blunting of the functions of the cerebral hemispheres without any perceptible concomitant actions.

Larger doses (twenty-five to thirty milligrammes for small animals) impair voluntary motion without lessening reflex excitability, which is retained at least to a certain extent even when the animal is lying perfectly limp and motionless in consequence of diffused paralysis of the central nervous system. Finally, even the most powerful reflex irritation will no longer disturb the general immobility, only respiratory movements occur promptly and powerfully after each stimulation, but soon disappear again after the cessation of the stimulus. With still larger doses of forty to sixty milligrammes even these movements are absent, and one might fancy that the animal was dead if the forcible pulsations of the heart did not sufficiently prove that life still continued. After thirty-six to forty-eight hours complete recovery usually occurs even from this condition, and indeed it is hardly possible to kill a frog by urethane without actually mummifying it with the drug.

*(To be continued.)*

## Reviews.

*The Pathology and Treatment of Stricture of the Urethra and Urinary Fistulae.* By SIR HENRY THOMPSON, F.R.C.S. New Edition. 8vo. London : Churchill. 1885.

THOUGH this edition is some 100 pages shorter than any of its predecessors, there is a gain in the amount of matter inserted, as many of the histories of cases which were formerly included are now omitted.

A more striking evidence it would be impossible to find of the progress of surgery during the last seventy years, than that which is afforded by a contrast of our present treatment of strictures with that adopted by Sir Everard Home, and of the modes by which we have arrived at our present comparative state of perfection the book before us gives an excellent account.

That a patient should be treated with caustics for fifteen years, and that at length, in the words of Sir Everard Home, a bougie should enter the bladder at the 1,258th application, is indeed a most signal example of a difficult stricture cured by perseverance; but happily modern investigation leaves us in no doubt that the difficulty was the result rather of the application of the caustic, than of the obstinacy of the stricture. It is a poor consolation to be informed that this was one of "the successful cases;" we shudder to think of those which were unsuccessful.

All this has been superseded we may hope for ever by the modern catheter, or by simple incision. Of these methods there are more than enough described, but we must confess to a feeling which is hardly adequately described by the word "disappointment" at finding but seven pages allotted to so-called urinary fever. After life-long experience of catheterisation Sir Henry Thompson should be able, more than any other surgeon, to throw light on the causes of this troublesome and sometimes dangerous complication.

*On some Common Injuries to Limbs, their Treatment and After-Treatment.* By EDWARD COTTERELL, M.R.C.S., L.R.C.P. Small 8vo, illustrated. London : H. K. Lewis. 1885.

THIS little book as its name implies draws attention to some of the commoner injuries of everyday life. We would fain hope

however that there is not such an amount of ignorance of these injuries amongst the medical profession as the author seems to imagine. The bone-setter is becoming a rarer animal, thanks to the attention which has been drawn of late years to the mode of treatment which he adopts. But it cannot be too widely known how disastrous are the results which he oftentimes produces, and how many a limb and even life has been sacrificed by his manipulations. Mr. Cotterell gives a good description of the so-called lawn-tennis arm and leg, which affections are not described in many text-books, but we question whether their exact pathology is so well established as the author of this work imagines. Slight injuries are rarely fatal, and hence their pathology is a matter of inference rather than of knowledge.

One singular statement we should like to draw attention to before concluding this notice. It is stated on page 84 that a patient treated for fractured patella with Malgaigne's hooks in 1868, and discharged with good bony union, is found in 1873 to have the fragments two inches apart. The conclusion drawn from this is, Do not have your patella wired, because bony union is no better than ligamentous. What evidence, we may ask, is there that bony union has ever resulted with Malgaigne's hooks? Bony union was proved to have taken place in Lister's cases by the presence of abundant callus.

*Face and Foot Deformities.* By FRED. CHURCHILL, C.M.  
Svo, illustrated. London: Churchill. 1885.

THE cover and the pictures which are contained in this book are so attractive, that we must confess to feeling disappointed at the text.

The book attempts to include a very wide area, in fact so wide that it is impossible to do the subject justice. For example, the attempt to deal with squint, its causes, results, indications for treatment by glasses or operation, in little more than a small page of large print is an impossibility. All we can glean from this page is that squint sometimes requires an operation and sometimes it does not; it may be the result of brain-disease and it may not; it may require glasses and it may not. Again it seems rather straining the term deformity, if chorea, hysteria, hemiplegia and tetanus are to be so classed. Other so-called deformities are scabies, pediculi, facial carbuncle, and chancre. If some of these had been omitted and a little more attention bestowed on the remainder, a more instructive work would have been the result.

## Clinic of the Month.

### Consequences of Long-continued Constipation.

—Dr. Bristowe illustrates as follows the consequences of long-continued constipation. One case was that of a married lady, aged thirty, who had suffered for many years from persistent constipation. About a week before Dr. Bristowe saw her she began to suffer from abdominal pain, with sickness, and disturbance of the bowels; and, on examination, a tumour was detected. This the author at first considered to be a movable kidney, but a week later the tumour had moved lower down, and then it was decided that the mass must be faecal. During the next three months this mass moved almost down to Poupart's ligament, and became flattened like a penny bun, at the same time becoming softer and more doughy. The patient was treated with enemata and purgatives, but they did not succeed in dispersing the tumour. The further history is not recorded, as the author lost sight of the patient. The second case was that of a woman, aged forty-six, who had suffered for many years from irregularity of the bowels, and at times with looseness and discharge of mucus. Long-continued constipation caused dilatation of the lower half of the large intestine, producing thickness and sluggishness of its walls, so that the faeces lagged behind, and lumps became impacted, as in the previous case. The offensive discharge was supposed to be due to the mucous membrane having become excoriated in different parts, from the long-continued irritation produced by the impacted faeces. Another case related is that of a little girl, aged eight, who was admitted into hospital with a history of long-continued constipation. The abdomen was large and tense, the body generally emaciated; she was supposed to be suffering from abdominal tuberculosis. Opening medicines were given and enemata employed, but no actual faecal matter was evacuated. Three weeks after admission the child died. The post-mortem examination revealed enormous distension of the large intestine, which was filled with thick, semi-solid, olive-green-coloured faeces. These were more solid in the rectum than elsewhere,

and, immediately above the anus, formed an indurated conical lump. The upper part of the rectum was dilated to within two inches from the anus. But there was no stricture here or elsewhere. Between the caecum and the rectum there were about half a dozen large tracts of ulceration, scattered at long and unequal distances from one another. Each occupied an area of from four to eight square inches. Two more cases are cited, showing how habitual constipation causes hypertrophy and dilatation of the colon. The importance of not allowing constipation to be neglected is insisted upon, together with the necessity of emptying the rectum by mechanical means, when there has been constipation of long standing, not readily yielding to medicines. (*British Medical Journal*, May 30, 1885.)

**Injections into the Lung.**—Dr. Wendall C. Phillips publishes two cases in which this treatment was resorted to. In the first patient, who was in the third stage of consumption, a single injection of ten drops of dilute Lugol's (iodine) solution was made in the third intercostal space two days before his death. Although life was probably not prolonged, the dyspnoea and severe muscular pain were so much relieved that the patient was no longer compelled to sit up in bed, and his remaining hours were rendered much more endurable. The second patient, a widow, æt. fifty, with phthisical symptoms of some six years' duration, was considerably benefited by five injections made at intervals of a few days; "Her cough is now much less troublesome, and no longer causes vomiting; she is able to go up stairs more easily, and performs her work with less fatigue." Dr. Phillips uses an ordinary hypodermic syringe, thrusting his needle to its full depth of one and a-half inches in the nipple line, and usually in the third interspace. The injections can be safely made high up in the axillary region in the first, second or third interspace, the arm being held at right angles to the body. Pain is usually trifling; but occasionally a severe paroxysm of coughing supervenes, and iodine is at once tasted in the mouth (when the fluid has been thrown directly into a bronchus?). In the same journal Dr. A. H. Smith gives the case of a coloured patient who had been under observation for eight weeks. His weight had been taken every week, and the temperature, sputa, &c., had been noted for a considerable time previous to the commencement of the injections. Lugol's solution diluted with five times its bulk of water was used; and of this five minims, gradually increased to eight or nine, were injected every three hours. The patient tasted the iodine as soon as he coughed after the injection. The injections, which constituted the only change in the previous treatment, had been continued for two weeks, and his weight had increased three pounds and a quarter;

the sputa had also become less purulent and tenacious, and were expectorated with greater ease. (*New York Medical Journal*, June 28, 1885.)

**Cocaine in Litholapaxy.**—Professor Bruns, of Tübingen, reports a case in which he obtained local anaesthesia of the bladder and urethra by injecting a cocaine solution, with the most gratifying result. The patient, a young man, had suffered for four years from stone in the bladder. Chronic cystitis was present, and evening feverishness. The injection of one gramme (mostly into the bladder itself, in a 2 per cent. solution, but also a little into the urethra) produced complete local anaesthesia for half an hour, during which time a very hard oxalate of lime calculus was thoroughly crushed, and removed without pain. After the injection, the patient assumed a different position, to bring the fluid into contact with the whole inside of the bladder; and after the operation, a little of a 10 per cent. of iodoform-glycerine emulsion was injected. The recovery was uninterrupted. (*British Medical Journal*, July 4, 1885.)

**Resection of the Ribs for Tumour of the Chest Wall.**—A case was related by Dr. Maas of an ossifying enchondroma of the ribs, during the removal of which portions of the ninth, tenth, and eleventh ribs to the extent of nearly three inches were cut away, together with the subjacent pleura. The pericardium and retracted lung lay free underneath. The edges of the skin were drawn together with strong sutures, and the healing was so rapid that by the fifth day vesicular breathing was audible at the level of the seventh rib. Healing was complete by the eighth day. (*Verhandlungen der deutschen Gesellschaft für Chirurgie*, 1885.)

**Abscess of the Abdominal Wall containing a Rabbit's Rib.**—A man presented himself with a fistula in the right groin. There was a hernia on the same side. He stated that the fistula had been in existence for two years, and had been preceded by violent pain and vomiting, with formation of abscess, which had been opened by his doctor. The wound was thoroughly examined by Dr. Jagot, who detected at the bottom a rabbit's rib, and removed it, after which the wound healed speedily. The only explanation offered was that, just previous to the formation of the abscess, the patient had been in the habit of bolting his food, and presumably he had swallowed the bone in question, which became entangled in his hernia, producing a localised peritoneal abscess. (*Progrès Médical*, June 13, 1885.)

**Surgical Treatment of Cysts of the Pancreas.**—Of all abdominal organs the pancreas has been least frequently

subjected to surgical treatment, for which the anatomical location of this organ, and the obscurity of its affections, furnish a sufficiently satisfactory explanation. Situated high up in the abdominal cavity, and hidden behind such important organs as the stomach, omentum, and transverse colon, it is the least accessible of all abdominal organs, and on this account its affections, wrapped in obscurity, have for the most part constituted objects for empirical medication. The relation of this gland to the surrounding organs and its great distance from the anterior wall of the abdomen, the only point of approach, necessarily offer serious obstacles to diagnosis and direct treatment. From a diagnostic point of view another great difficulty is our want of positive knowledge concerning the physiological functions performed by this gland in the process of digestion. As the symptomatology of all affections of the pancreas is always obscure, and a probable diagnosis can only be made in cases where the gland has become considerably enlarged by disease, it is apparent that our present clinical knowledge is limited to diseases which increase the size of the organ to a sufficient extent to permit its detection by palpation. Primary malignant disease of the pancreas, when it has advanced to such an extent that its presence can be diagnosticated with certainty by physical signs, will have invaded the adjacent tissues to such a degree as to preclude the advisability of an operation, consequently the efforts by the surgeon, for the present at least, must be directed exclusively toward the recognition and treatment of benign affections of this gland. Clinical experience does not extend beyond an imperfect knowledge of cysts of the pancreas. The pancreas, like other secretory organs, is prone to become the seat of cystic tumours, the result of obliteration or obstruction of the common duct, or one or more of its branches. Cysts originating in this manner are true retention cysts, containing the physiological secretion from the distal portion of the gland tissue, with perhaps accidental products, such as altered secretions, blood, and the products of inflammation.

In a very valuable paper on the surgical treatment of cysts of the pancreas, Dr. N. Senn, of Milwaukee, presents a full report of a case of retention cyst of the pancreas, which has recently come under his observation, and, at the same time, summarises, in a compact form, the clinical history of similar recorded cases which serve as a basis for some general remarks. In recapitulation, Dr. Senn submits the following conclusions:—  
(1) Cysts of the pancreas are true retention cysts. (2) Cicatricial contraction or obliteration of the common duct or its branches and impacted calculi are the most frequent causes of cysts of the pancreas. (3) A positive diagnosis of a cyst of the pancreas is impossible, a probable diagnosis between it and some other

kind of cysts amenable to the same surgical treatment is adequate for all practical purposes. (4) The formation of a pancreatic fistula under antiseptic precautions recommends itself as the safest and most expedient operation in the treatment of cysts of the pancreas. (*Amer. Journ. Med. Sciences*, July 1885.)

**Cholecystectomy.**—M. Thiriar, of Brussels, in a communication to the French Congress of Surgery deals with the following objections to cholecystectomy, an operation first performed by Langenbuch of Berlin in 1882. (1) The existence of a gall-bladder is necessary for the purposes of digestion in man. (2) Calculi may be formed elsewhere than in the gall-bladder. (3) The operation is a very serious and dangerous one. (4) Cholecystotomy or the production of a biliary fistula ought to be preferred. It is argued by M. Thiriar that the gall-bladder is not indispensable to the regularity of the digestive functions in man. This organ is absent in many of the mammalia, and occasionally it is found completely closed and atrophied in man. The formation of calculi elsewhere than in the gall-bladder is an extremely rare occurrence, except in certain pathological conditions which give rise to such formation in the biliary ducts and canals. These pathological conditions (cancer, obstruction of the biliary passages), however, constitute a formal contra-indication to operative interference. Cholecystectomy, it is acknowledged, is decidedly a difficult and delicate operation, but in considering the much diminished dangers of peritoneal lesions when produced with strict observance of the antiseptic method, M. Thiriar is of opinion that this procedure is the least severe and the least dangerous of all the varieties of laparotomy. It is a justifiable operation, he holds, in cases of biliary lithiasis that have resisted medical treatment, and in which violent paroxysms occur from time to time. With regard to the operation of cholecystotomy that has been proposed by Mr. Lawson Tait, although it is less difficult than cholecystectomy, it is attended by the inconvenience of leaving a biliary fistula, a condition not free from danger. Moreover, as it does not remove the organ in which gall-stones are formed, the production of these bodies may be continued. Two cases of cholecystectomy are reported in this paper. In one, the patient was a woman, aged forty-three. The gall-bladder contained a mass of thick bile, but no calculus. The operation lasted during one hour and a half, and resulted in complete success, without any complications. The subject of the second case was a woman in the fifth month of pregnancy. The gall-bladder contained twelve calculi. The operation lasted during one hour, and proved successful. The progress towards recovery was unin-

terrupted, and the pregnancy followed the usual course. (*Revue de Chirurgie*, 5, 1885.)

### The Treatment of Cephalocele and Spina Bifida.

—A paper by Prof. Schatz, of Rostock, on the respective advantages of expectant and operative treatment of cephalocele and spina bifida, is of some interest when considered in relation with the report lately presented to the Clinical Society by its Spina Bifida Committee. Taking as his text the expressed opinions of Heinecke and Steffen, both of whom speak in gloomy terms of the prospects of success after any radical operation, he presents a list of cases of encephalocele to illustrate the relative prognosis with and without operative interference. Of 105 cases, 59 were occipital and 46 frontal in position. Of the former, 24 were left untreated, and only three recovered, 35 were operated upon by incision, injection of iodine or ligature, with 6 recoveries. Of the frontal encephaloceles, 6 out of 32 survived without treatment, and only 3 out of 14 cases after operation. A few cases of spina bifida, quoted from Lorinser, show much the same proportion of success, and, in the opinion of that author, justify the view that no operative interference should be attempted when it can be clearly shown that a communication exists between the sac and the vertebral canal. Professor Schatz himself considers that operation is only justified when there is no such communication, and when the tumour is covered with healthy skin, is fully translucent and not painful. In other, cases, however, he would endeavour to secure the isolation of the tumour from the arachnoid cavity by means of graduated constriction or pressure calculated to set up a process of plastic adhesion, when applied to the base or pedicle, if there be one, of the tumour. He relates the particulars of three cases in which he operated by emptying and removing the sac, the base or pedicle of which was firmly secured by means of a long clamp, such as is at times used to secure the stump of an ovarian tumour. His first case was one of spina bifida, and was not successful in saving the life of the child. In the second a large encephalocele was successively emptied and removed with but little disturbance of the child's health, life being prolonged to the eleventh year. The symptoms and physical signs of internal hydrocephalus were, however, always present, and gradually increased, the child remaining paralysed in the lower limbs and of very feeble intelligence. In the third case, a series of encephalic protrusions were in like manner clamped and removed, and notwithstanding the great extent of the hernia, the case, after some suppuration and many fluctuations of temperature, ultimately recovered and is still living, although with a steadily increasing hydrocephalus. All these cases were in themselves severe, and hence the merits

of the operation must be considered apart from them : it is possible, however, that the method of compression by clamps, when applied to the more simple cases of the kind, may be found to enhance the chances of success to a very considerable degree. (*Berliner klinische Wochenschrift*, No. 28, 1885 ; *Med. Times.*)

**Transplantation of Bone.**—We learn from a lay contemporary that Prof. Bergmann, of the Ziegelstrasse Hospital, Berlin, has recently had a successful case of transplantation of bone in the human subject. The operation is not new to science, for Ollier of Lyons and others have shown that in the lower animals portions of bone may be readily grafted on to a freshened surface. As in all other measures taken with a view to the restoration of lost tissues or members, the difficulty increases as the scale of development is ascended, or, in other words, the more highly organised and specialised the elements of a part the less is their tenacity of life. There is a certain amount of energy distributed in the body for growth, development, and repair, with discharge of functional activity. At first sight it seems surprising that transplantation of bone has not been more extensively practised on the human subject. The explanation is simple and ready to hand. In cases of fracture, even with loss of substance from detachment of splinters, nature is full of resources for replacing the necessary material ; and again, it is well known that the entire shaft of a long bone may be excised within a few days of its destruction by acute suppurative osteitis, and a new one be regenerated with tolerable certainty. It is not for such cases then that transplantation of bone is likely to be required ; but in those more numerous instances where the osseous tissue is eaten away by insidious disease. Unfortunately for the patient, the vitality of the surrounding bone is usually too low to warrant any great hope of the method of extrinsic repair now under consideration. In order that the graft may "take," a rapid vascularisation of the callus is necessary, but in caries the organising power, except in rare cases, is too feeble. Still, there is no telling what surgical science and art may eventually accomplish, and for that reason we look forward with curiosity and interest to the future records of bone-grafting. (*Lancet*, July 4, 1885.)

**Arcus Senilis in a Boy.**—Dr. Hansell, of the eye department of the South-Western Hospital, Philadelphia, reports the case of a mulatto boy three and a-half years old, in whose cornea of each eye a well-marked and unmistakable arcus senilis was visible. "Circulus," he says, would be a better name for it, so complete was the ring, although not quite so well developed below as above, and on the sides. It appeared simultaneously

about a year ago, when the boy was convalescent after measles, and slowly advanced until the arc was converted into a ring. There had been no preceding affection of the eyes. These rings of fatty degeneration in nowise differed in appearance from the arcus senilis in the adult. There is a margin of clear cornea between them and the sclerotic border, and they are sharply bounded towards the centre by clear corneal tissue, which shows no trace of previous inflammation. The boy exhibits no other anomalies, and is in perfect health. No hereditary history existed. Dr. Hansell believes the case to be unique, the youngest instance recorded by Canton having occurred in a boy twelve years of age. (*Philadelphia Medical News*, April 4, 1885.)

**Osmic Acid in Trigeminal Neuralgia.**—Dr. Schapiro in a recent lecture before the St. Petersburg Medical Society gave an account of the chemical and therapeutical history of osmic acid, commencing with the discovery of the metal osmium in 1804 by the English chemist, Smithson Tennant, and concluding with his own observations made during the latter half of 1884 in the ambulance of the Imperial Philanthropic Society, when he employed injections of osmic acid in eight cases of trigeminal neuralgia, all of them severe, very obstinate, and of long standing. Of these cases five were cured, two improved, and one derived no benefit from the treatment. The formula used by him was—*R Acidi osmici, 0·1 ; aquae dest. 6·0 ; glycerini chemice puri, 4·0.* This he found kept well for two or three weeks; while the simple watery solution began to become brown in three or four days, and afterwards turned black, and was then useless. As one gramme costs four roubles (eight shillings), being thus four times as dear as gold, it is of considerable importance to make use of a solution which will keep. The writer also found no dark specks in his solution such as are to be met with in that used by Neuber. The dose injected was at first five drops, afterwards more, the medium dose being eight drops. The only time when any unpleasant symptom occurred was in the case of a highly nervous lady who had been subject to epilepsy, and in whom the injection induced an attack of faintness very similar, in Dr. Schapiro's opinion, to the petit mal, and he suggests that with nervous patients the possibility of the occurrence of faintness should be borne in mind. The only case in which no improvement followed the treatment was that of a lady whose case was diagnosed by Professor Erb as hysterical neuralgia, and who suffered from severe pain in the neck and back of the head, and was believed to have some central lesion. In her case a single injection was followed by increased pain, and she refused to allow any more injections to be attempted. Dr. Schapiro not having observed any evil local

effects such as were described by Leichtenstern (sanguineous bullæ, scabs, tedious boils) does not hesitate to inject under the skin of the face. He does not at present go deeply into the theory of the action of osmic acid, though he intends to study this experimentally; but he remarks that its most important action is to cause inflammation of the terminal nerve branches, its narcotic effect being of a secondary nature only. (*Lancet*, Aug. 1, 1885.)

**Mercurial Injections in Syphilis.**—It is now some time since the employment of subcutaneous injection of hydrargyrum formamidatum was recommended in the treatment of syphilis. The interval has not been misspent by Dr. Carl Kopp, who has brought together the results of his experience in the *Vierteljahr für Dermatologie und Syphilis*. Altogether, 3000 injections were made on 126 cases, giving an average of twenty-five injections per case. Sixty-five cases were males, and sixty-one females. Fifty-three times the disease was treated whilst in its primary form. The secondary stages were treated seventy-one times. Only two cases belonged to the tertiary period. The symptoms disappeared under the treatment in ninety-two cases. Thirteen times the injections had to be discontinued on account of untoward effects. In spite of prolonged treatment, eleven cases failed to be benefited by this method. Ten cases were doing well under the treatment, but this was allowed to lapse from some cause or another. Tenderness about the seat of injection was noted altogether sixty-five times; thirty-four times this subsided in an hour, and in the remainder the tenderness lasted from two to twenty-four hours. Forty-one times an induration developed at the point of puncture. An abscess formed once in a woman. Salivation and stomatitis were recorded twelve times, eight times in men. The injections were continued for a long period in thirty-nine cases, without any unpleasant after-effects. Universal erythema in a woman, eczema of both lower extremities in a man, and parenchymatous nephritis in a woman, were the complications observed during the treatment, but it would be difficult to say what share the injections had in their production. We append some of the conclusions formulated by Dr. Kopp. Liebreich's preparation is decidedly useful in certain of the milder forms of primary lues, as also for many slight secondaries. The formamide should not be employed in severe cases where there are large papules or thick infiltrations; inunction is still the best method of treating these cases. The tertiary forms are likewise not to be treated by the formamide. Relapses are by no means prevented by Liebreich's method; on the contrary, they appear to be extraordinarily common after this treatment. (*Lancet*, Aug. 8, 1885.) [Pract. xxx. 368.]

**Salicylate of Iron in Rheumatism.**—Dr. C. C. Duffy, of New York, writes to call attention to the value of salicylate of iron in the treatment of rheumatism, particularly when occurring in the subacute form. The impoverishment of the blood, so commonly occurring in the later stages of an attack of rheumatism, is to be attributed, he believes, not only to the disease itself, but also, when salicylic acid is exhibited, to the action of this substance upon the iron of the blood. He was in the habit, for a time, of prescribing some form of iron in alternation with salicylate of sodium, but met with no signal success. He then determined to exhibit the remedies in combination and has had most satisfactory results. He uses a mixture each dessert-spoonful of which contains eight grains of salicylic acid, four grains of sodium salicylate, and one grain of ferrous malate. This is the usual dose, though sometimes even double the quantity is given. Dr. Duffy relates two cases of a number in which he has used salicylate of iron. The first case was that of an engineer, twenty-six years of age, suffering from an acute attack of rheumatism, involving both knees and ankles and the left elbow. The salicylate of iron mixture was given in dessert-spoonful doses every four hours, and at the end of three days the patient was able to return to his business and has remained well. The second case was one of an acute exacerbation of chronic rheumatism occurring in a domestic, twenty-two years of age. She had had her first attack some three years previously, and for the past six or eight months had never been free from pain, though able to perform her ordinary duties most of the time. The salicylate of iron mixture was given in the usual dose four times a day. At the expiration of about a month she was entirely relieved. In neither of these cases were any local applications made to the affected joints, nor were any other remedies employed. In a number of other cases a similar treatment was followed by equally good results, and in no instance was it necessary to resort to any other medication. (*New York Med. Record*, July 11, 1885.)

**Suppurative Hepatitis.**—Ughetti gives the history of eight cases of suppurative hepatitis. In three, the hepatic abscess was opened externally by incision through the abdominal wall: these cases recovered. In one, recovery followed repeated aspiration. Two died, notwithstanding aspiration and incision. In two, the abscess opened spontaneously by the bronchi, recovery resulting. Among the causes of suppurative hepatitis wounds are most rare. Dysentery is a much more frequent cause. The hepatitis may be developed contemporaneously or consecutively, therefore possibly there is a common origin to both. The disease, as is well known, is most common in hot climates.

It is said that non-acclimatisation is a predisposing cause, but in the cases observed by Ughetti this did not appear. All his cases occurred in men, twenty-six being the age of the youngest, forty-three of the oldest. The fever of suppurative hepatitis is variable in intensity and duration. When present it is generally intermittent; often it only appears when the collection of pus is too great for the cavity containing it. In a case published by Ciaramelli (Naples, 1880), there had never been any fever, yet a vast abscess of the liver was found, encapsulated by a thick layer of connective tissue which prevented the reabsorption of the pus. Discussing the symptoms, Ughetti remarks on the influence of palpation, hepatic pain, pain in the shoulder, jaundice, deeply pigmented urine, &c. As to the diagnosis, he mentions specially the difficulty in certain cases of distinguishing suppurative hepatitis from Naples fever, in which the course of the fever is very irregular. He advises exploratory punctures for diagnosis and treatment. Entire hepatic cells are not ordinarily found in the pus, but may sometimes be obtained on scraping the bottom of the abscess. The prognosis is not as hopeless as most authors assert. In forty-eight cases not operated on, the mortality was seventy-six per cent. In forty-five cases in which incision was practised, the mortality was only forty-two per cent. In thirty-eight cases opening spontaneously by the bronchi, the mortality was only 14·6 per cent. All cases should be operated on as early as possible; peritoneal adhesions are not indispensable. Aspiration is often sufficient to effect a cure. (*London Medical Record*, June 15, 1885.)

**Glycosuria in the Aged.**—Some careful observations bearing on glycosuria in the aged have been recorded by Dr. Landrieux and M. H. Iscovesco. By the term glycosuria, as distinguished from diabetes mellitus, they describe those cases in which the excretion of sugar by the kidney is intermittent. Their researches confirm the already known clinical fact that this intermittence is especially characteristic of the disease in elderly people, though they also note a case of the continuous variety. An intermediate form is that in which the successive attacks are not quite separate, but one begins during the decline of its predecessor. The connexion between senile glycosuria and nutrition is well brought out in some of the cases here quoted. Six cases are detailed. The age in all was over sixty years. All were females, and all gave evidence of the gouty diathesis. Three were rheumatic, or related to rheumatic persons, one had had cancer of the breast. In one or two instances the general health seemed unaffected, in the others obstinate inflammatory disorders of the gums or conjunctiva accompanied the signs of glycosuria, and lasted in the intervals when these were absent.

The usual signs, such as polyuria, boulimia, and thirst were present as a rule during the attacks. Albumen was present in about 60 per cent. of the analyses of urine, bile pigments in 25 per cent. No traces of jaundice were present, however, at any time; other proteids were also detected during these analyses. Whether the glycosuria is due to excessive glycogen-formation, or to its diminished consumption when formed in normal amount, the evidence here available does not show. The above-named observers, however, hold that their cases support M. Bouchard's view, that the cause at work in this disease is deficient metamorphosis, and that in virtue of this an excess of carbohydrate material passes into the blood and is excreted. They quote the fact that the glycosuria is accompanied in many cases by excretion of albuminoids and bile pigments absorbed from the alimentary canal, which have failed to complete their normal chemical changes, as giving support to this view. (*Progrès Médical*, June 27, 1885.)

**Disseminated Sclerosis in Children.**—According to P. Marie, disseminated sclerosis is by no means unknown in the first years of life, and he even asserts that it is frequent between the ages of three and four years. (*Revue de Médecine*, p. 536, 1883.) The "hereditary" form of ataxy described by Friedreich is regarded as its nearest clinical ally. Moncorvo observed three cases of multiple sclerosis out of a total of 700 children in his practice, extending over one year. Marie collected fourteen cases. Moncorvo points out the frequency of epileptiform or apoplectiform convulsions at the onset of the malady; the disorders of motion and the cephalic symptoms, such as ocular paralysis, defects of speech and intellect, were present, according to him, in fifteen out of seventeen cases on record. In all three instances which Moncorvo observed, the signs of hereditary syphilis were either observed or matters of history. He thinks that syphilis may be operative in the production of cerebro-spinal sclerosis. Two of his cases were benefited by treatment with mercurials and iodide. (*Lancet*, Aug. 29, 1885.)

## Extracts from British and Foreign Journals.

**Is Acetonæmia the Cause of Diabetic Coma?**—Contrary to the observations of Patters in 1857, whose views have been accepted by subsequent authorities, Albertoni, writing in the *Rivista di Chimica, Medica e Farmaceutica*, endeavours to show that acetone is not the poison which causes death in diabetic patients. Indeed, when administered by the mouth it is, if pure, less poisonous, he states, than ordinary ethylic alcohol. The phenomena observed in diabetic coma are by no means always similar to those produced by acetone. He gave large doses (100 grammes) of glucose to rabbits, but could detect no acetone in the urine. Isopropylic acid is partly changed in the organism, acetone being formed; part of the acid is, however, passed unchanged. In man, when a dose of six cubic centimetres is given by the mouth it is detected unchanged in the urine. Aceto-acetic ether does not produce symptoms of diabetic coma, but it does cause albuminuria and haemoglobinuria, and is certainly eliminated in an unaltered condition. From previous researches it seems evident that aceto-acetic acid often exists in diabetic urine, its presence being detected by the red colour given with perchloride of iron if the urine is not boiled or treated with an acid. This acid is well borne by the organism, and cannot be the cause of severe poisoning. The condition which governs its appearance in the urine is the reaction of the urine and that of the renal parenchyma. If the urine is acid, the aceto-acetic acid is decomposed, forming acetone; but if alkaline, neutral, or slightly acid, the aceto-acetic acid is found unchanged. This is the explanation of the discordant observations on this subject. It is probable that the formation of aceto-acetic acid explains the presence of albumen, which is sometimes observed in diabetes. Crotonic acid, the formation of which in diabetes was demonstrated by Stadelmann, cannot be considered as poisonous, two grammes producing no effect on rabbits. Crotonic aldehyde is, on the other hand, highly poisonous, even in small doses, four drops producing in a rabbit dyspnoea, and even narcosis, with the exhalation of an odour resembling crotonic aldehyde and other

phenomena which are described by Kussmaul as present in diabetic coma. Large doses caused powerful disturbance and rapid death, with epileptiform convulsions. (*Lancet*, July 4, 1885.)

**Regeneration of Nerves.**—“Fresh Researches on the Regeneration of Peripheral Nerves” was the subject of a paper communicated to the Académie des Sciences by M. Vanlair (*L’Union Médicale*, July 11). If the process of regeneration be studied in the divided sciatic nerve of the dog, after the lapse of several years it will be found that the initial phases of the evolution are accomplished in a definite manner, whilst the final stages are by no means uniform. In all cases the lower extremity of the central portion of the nerve exhibits a proliferation of the marginal zone of nerve fibrils, a disappearance of the axial fibres, and a sprouting of new fibres, which project into a new formation of connective tissue. The whole forms at the central end of the divided nerve a “neuroma of regeneration.” The further changes vary in different cases. Sometimes the neuromatous formation remains sterile; it stretches a little distance from the divided end, then becomes thinner, and disappears without giving rise to any nerve fibres. Sometimes genuine nerve fibrils are formed. This organisation which is often achieved only after a series of fruitless attempts, results in the formation of a longitudinal and systematic arrangement of nerve fibres. The author insists on the importance of mechanical conditions in assisting the regenerative process; the chief mechanical condition is the accurate apposition of the divided ends. (*Lancet*, Aug. 1, 1885.)

**Transplantation of large Pieces of Skin in recent Wounds.**—Esmarch brought forward at the German Congress of Surgeons some pictures to illustrate the importance of such treatment. One was a case of lupus of the nose, another a facial mole. The success in both cases was complete; the flaps united by first intention, and the scar was quite insignificant. The conditions necessary for success are—that all the subcutaneous tissue should be cut away, and the flaps laid flat on the raw surface, where they should be firmly secured by a few stitches and a bandage. (*Verhandlungen der deutschen Gesellschaft für Chirurgie*, 1885.)

**Destruction of Typhoid Bacilli.**—E. Bagenoff, in the *Yegened klin. Gazzetta*, 1885, Nos. 5 and 6, states the following facts concerning the bacilli of typhoid fever of Eberth and Koch. (1) The bacillus of typhoid fever is preserved in water and may even multiply to a certain extent. Therefore, drinking-water should be considered as a source of infection of typhoid fever.

(2) The milk of the cow is not a favourable medium for developing the bacilli of typhoid fever; nevertheless, these bacilli may live and be multiplied therein, and therefore the milk of the cow may be an intermediate means of transmitting the infection of typhoid fever. (3) Gastric juice destroys the bacilli of typhoid fever. (4) The parasiticide action of the gastric juice depends only upon the action of the hydrochloric acid contained therein. (5) Pepsin, bile, and the pancreatic secretion do not destroy the vitality of these bacilli. (6) Bile and the pancreatic fluid even seem to favour the development of the typhoid bacilli. (7) Cold arrests the development of these bacilli, but does not destroy them. (8) A temperature of from 98° 6 F. to 107° 6 F. is most favourable for the development of the bacilli of typhoid fever. Above 113° F. their development is impeded and is entirely arrested when the temperature exceeds 122° F.; the *bacilli* perishing, but their *spores* preserving their vitality. (*Gazette Médicale de Paris*, May 2, 1885.)

#### Abortive Treatment of Typhoid Fever with Naphthalin.

—L. Götze, in *Zeitschr. für klin. Med.*, 1885, No. 1, reports the use of naphthalin in a local epidemic of typhoid fever. Thirty-five cases in all were treated with the following results. With the exception of three cases treated with the drug, enlargement of the spleen was not noticed. The remedy was administered in doses of 15 grains, and 75, 90, and even 105 grains daily were received by the patients. Other remedies were substantially not administered. The naphthalin employed was that directed by Rossbach, the purest resublimated with the oil of bergamot. During the course of the disease all the patients received over 1050 grains, and many of them 2100 grains. Untoward effects (with one exception, in which naphthalin intoxication was exhibited chiefly in the form of brain depression, which was readily relieved by soda sulphurata), were not observed. The course of the disease, on the whole, was exceptionally favourable, and the intestinal symptoms—diarrhoea, pain in the cæcal region—were favourably influenced. In three cases the disease appeared to be generally shortened by the drug. Other cases through its use became abortive in from six to ten days; in some others the fever did not continue more than sixteen days. In a final series of cases the process of the disease was not shortened, but the period during which marked elevation of temperature was maintained was curtailed. Three cases died from serious complications. In cases in which antipyrin in apyretic doses failed to reduce the temperature, naphthalin produced such effect, as was proven by several trials always with the same result. (*Centralblatt für klin. Med.*, May 30, 1885.)

**Pyridine in Asthma.**—M. Germain Sée, at a meeting of the Académie des Sciences, held June 2, 1885, summarised his treatment of neuro-pulmonary and cardiac asthma, as follows: (1) Whatever the form of the asthma, whether it be nervous, emphysematous, or catarrhal, or of gouty origin, the treatment by iodine constitutes the truly curative method. When iodism occurs the employment of pyridine will be found useful, and may be considered a certain means of curing the attack. This remedy is the best palliative, though iodine is the efficacious remedy, in the treatment of the disease. (2) Pyridine is superior in the effects produced to the hypodermic injection of morphine; its action more permanent and less offensive. (3) In simple neuro-pulmonary asthma the attacks may be altogether suspended. In asthma complicated with serious pulmonary lesions, the treatment should exceed eight or ten days in order to obtain permanent amelioration. In cardiac asthma, with or without renal and dropsical complications, pyridine is of great service in combating the continual or paroxysmal oppression which accompanies the disease. (*Gazette Hebdomadaire de Médecine et de Chirurgie*, June 5, 1885.)

**Nitro-glycerine as a Substitute for Alcohol.**—In the July number of the *Therapeutic Gazette*, Dr. Joseph B. Burroughs of Manchester, N.Y., recommends the employment of nitro-glycerine as a substitute for alcohol. He states that some time ago, whilst using nitro-glycerine in a case of angina pectoris, and watching its wonderful stimulating effect on the heart and blood-vessels, it occurred to him that it might be advantageously employed in many diseases in place of alcohol. At first he was unwilling to rely on it solely, but as he became more fully acquainted with its effects he began to realise that as a heart stimulant it is far superior to brandy. Alcohol in its effects on the system is classed with chloroform and ether. All three produce first a period of excitement, followed by unconsciousness. In the case of chloroform and ether the second stage is quickly reached, so that they are readily available as anaesthetics. With alcohol the first stage is of longer duration, the secondary effect not being apparent unless large quantities are taken, so that it is generally employed as a stimulant to the heart and circulation. Nitro-glycerine, possessing this stimulating effect in a pre-eminent degree, may be given with confidence whenever the administration of brandy is indicated. Its advantages are, in the first place, that a very small quantity is required, one or two drops of the 1 per cent. solution being equivalent to one ounce or more of brandy; secondly, that it is tasteless, colourless, and practically odourless; thirdly, that it acts immediately and without any appreciable interval; and,

finally, that it is not likely to induce a craving for alcoholic stimulants. An extensive experience has shown that it is of great value in the shock resulting from accidents, in the nausea and faintness following surgical operations, in the failure of the heart's action due to the administration of chloroform, in opium poisoning, in asthma, hysterical aphonia, and the collapse of typhoid and other fevers. Dr. Burroughs gives a detailed account of a number of cases in which he has employed it in the manner indicated. The suggestion is a good one, and will probably be extensively adopted. (*Lancet*, Aug. 8, 1885.)

**Operation in deep Wounds of the Abdomen.**—Dr. Chavasse, in a recent paper on this subject, referring especially to cases of rupture of the intestine without wound of the abdominal wall advises thus:—(1) Laparotomy should be practised in all cases, except where there is such well-marked collapse or so high a temperature that death would ensue during the operation, or else in cases of concomitant injuries of the liver, pancreas or spleen. (2) The operation to be successful should be performed as soon as possible after the injury. (3) If the rupture of the intestine involves less than half its circumference, it may be stitched up, and a drainage tube inserted in the peritoneum. If more than half the circumference is involved make an artificial anus. (*Congrès français de Chirurgie*, April 1885.)

**Climatic Treatment of Pulmonary Tuberculosis.**—Dr. K. Chodounsky makes the following summary of the points worthy of consideration in the climatic treatment of pulmonary tuberculosis: (1) Contraindication to all climatic therapy is found (a) in the existence of high fever; (b) in great extension of the tuberculous disease, unless its progress has ceased; (c) in a debilitated condition which compels the patient to remain in bed; (d) peritoneal and intestinal complications. (2) Contraindications to an elevated region: (a) erythema; (b) advanced anaemia; (c) changes due to advanced life, especially of the vascular system; (d) an habitually accelerated pulse; (e) diminished inspiratory power; (f) all fevers; (g) pneumonic tuberculosis in all stages; (h) chronic miliary tuberculosis with frequent exacerbations; (i) laryngeal catarrh and tuberculosis; (j) the stage of decay, unless under specially favourable circumstances; (k) complications with cardiac and vascular disease; (l) disease of the kidneys; (m) neuralgia and neuroses of typical nature. Elevated climate is indicated for haemorrhagic cases as follows: (a) in haemoptysis in the initial stage; (b) in slight passive haemoptysis; (c) in congestive haemoptysis after discontinuance of the fever and an interval of eight weeks since the last haemorrhage; (d) in haemorrhagic cases with cavities, if the decay and the fever have ceased and no haemorrhage has

occurred for a period of eight weeks. (3) Indications for a "plain" climate are: (a) moderate fever in which the temperature does not rise above 100°·4 F.; (b) tuberculosis in the stage of decay with moderate characteristic symptoms; (c) haemorrhagic cases with cavities and moderate symptoms, and an eight weeks' interval since the last haemorrhage; (d) congestive haemoptysis; (e) laryngeal catarrh and tuberculosis; (f) heart, vascular, and nervous complications for which the elevated regions are contraindicated; (g) cases in which irritability of the air-passages exists; (h) cases with diminished power of inspiration and an habitually accelerated pulse; (i) advanced anaemia; (j) advanced age. (*Allgemeine Wiener med. Zeitung*, May 19, 1885; *Philad. Med. News.*)

**Cardiopathy at Change of Life.**—A recent writer, M. Clement, proposes under the term "Cardiopathie de la Méno-pause" to comprise all the cardiac perturbations to which women are liable at the change of life. The derangements are said to be unaccompanied by the physical signs of valvular disease. We cannot say whether the author uses the above mode of expression as a precaution against misinterpretation. The difficulty always has been to decide whether there is any valvular affection or not. Some amount of enlargement of the heart is not uncommon at the menopause, and it is certain that cardiac murmurs are by no means infrequent at this period. The commonest age at which the cardiopathy manifests itself, following M. Clement, is from forty to forty-six. Palpitation, dyspnoea, sensations of fainting even ending in syncope, feeble unequal pulse, and oedema of the lower extremities are the symptoms which are put down to the cardiopathy. However severe the paroxysmal affection may be, a cure nearly always results. Restoration takes place slowly. In the final attacks the symptoms lose their gravity, and only appear at long intervals, possibly then being induced by some obvious cause, such as fatigue, a chill, or some powerful emotion. The pathogeny of this paroxysmal affection is believed by M. Clement to be a special disposition brought about by the menopause, in which there is a profound alteration of the innervation of the great sympathetic, which is translated as an over-action of the accelerator nerves and as a vascular spasm. The presence of anaemia sometimes aggravates these disorders. Infusion of digitalis, opium, and extract of convallaria are the chief remedies recommended. (*Laneet*, August 11, 1885.)

**Poisonous Alkaloids in the Urine.**—M. Chantemesse has summarised the history of this subject in an article, of which the following is an abstract. Professor Bouchard has drawn attention to the poisonous character of normal urine. This fact has been often previously asserted, its various constituents, from urea to

potash-salts being incriminated. In 1880, Pouchet found an alkaloidal substance in urine. Bouchard has lately proved that alkaloids normally exist in the bodies of living animals. They are formed in the intestine by the action of the vegetable organisms, which effect the intestinal putrefactive and fermentative processes. These alkaloids are absorbed into the blood, and appear in part in the urine. The following physiological effects are stated by Bouchard to follow the injection of urine into the veins of a rabbit: contraction of pupils, slow respiration, muscular weakness, lowered temperature, abolition of reflexes, and torpor followed by death, which takes place by arrest of the respiration. Having established the poisonous character of urine, he sought next to determine the particular constituent to which this effect is due. He found that it required much more urea to kill an animal than was contained in a poisonous dose of urine. Uric acid was nearly harmless, as were the extractive matters, while the potash-salts, though undoubtedly poisonous, were not so in the small quantities contained in the urine injected. After decolourising with animal charcoal, the urine lost half its toxic power. The poison is not volatile, for it resists boiling and is equally present in extracts of urine as in urine itself. Extract of urine acted peculiarly; it did not cause contraction of the pupils, but produced salivation. This alkaloidal substance which produces salivation is met with also in muscle, liver, and blood. In normal urine its production is very small. Lépine and Guérin have shown that these alkaloidal bodies are increased in various acute diseases, such as typhoid fever and pneumonia: but they have failed to find any increase in the urine of diabetes, catarrhal jaundice, cirrhosis with jaundice, alcoholic cirrhosis with jaundice, in the fluid withdrawn from the pleura and peritoneum of the last case after death, and also from the body of a patient dead of Addison's disease, or in the peritoneal fluid drawn off during life from a case of chronic peritonitis. The alkaloid found in the urine of typhoid fever stopped the heart in diastole, while that of pneumonia stopped it in systole. (*British Medical Journal*, July 4th, 1885.)

**Regeneration of the Spleen in the Fox.**—Professor Eternod, of Geneva, publishes an interesting account of his researches on this point. His results are confirmatory of Tizzoni's. The chief point of interest was that, four months after the spleen had been entirely removed, a nodule of newly-formed splenic tissue was found, enclosing in its substance foreign bodies that could only have been introduced through the wound at the time of the operation. The nodule was thirteen millimetres long and eight broad; and apart from some

embryonic tissue, in microscopic character it was almost identical with the normal spleen. Amongst the other conditions found, the most noteworthy were the new formation of adenoid tissue, especially in the lymphatic glands and in Peyer's patches, and the transformation of the parenchyma of lymphatic glands into splenic tissue. This last circumstance supports the view held for some time by Professor Eternod, that the spleen is only a vast elaborated lymphatic gland. (*Rev. Méd. de la Suisse Romande*, January 15, 1885.)

**Strophanthin, the New Diuretic.**—Professor Fraser's paper on *Strophanthus hispidus*, read in the Section of Pharmacology and Therapeutics, at the meeting of the British Medical Association at Cardiff, places us in the possession of a new and valuable heart-remedy and diuretic. It appears that the drug is extensively used in many parts of Africa as an arrow-poison. In the Mangauga district, near the Zambesi, it is called "kombé," whilst in Senegambia and Guinea the name "Inée" is more commonly employed. Dr. Livingstone, in his *Narrative of an Expedition to the Zambesi*, refers to this poison, and says the arrows are usually made in two parts. "An iron barb is firmly fastened to one end of a small wand of wood, ten inches or a foot long, the other end of which, fined down to a long point, is nicely fitted, though not otherwise secured, in the hollow of the reed which forms the arrow-shaft. The wood immediately below the iron head is smeared with the poison. When the arrow is shot into an animal, the reed either falls to the ground at once, or is very soon brushed off by the bushes, but the iron barb and poisoned upper part of the wood remain in the wound. If made in one piece, the arrow would often be torn out, head and all, by the long shaft catching in the underwood, and striking against trees." The plant which yields the poison belongs to the Apocynaceæ, and has been described and figured by Professor Oliver, of Kew, under the name of *Strophanthus kombé*. It is a woody climber, and flowers in October and November. The follicles vary in length from ten to twelve inches, and contain from 150 to 200 seeds, each weighing about half a grain, and bearing a beautiful plumose tuft, placed at the extremity of a delicate stalk. They contain no alkaloid, but are rich in an active principle, which Dr. Fraser calls "strophanthin." This is a crystalline substance of intense activity, which seems destined to play an active part in our list of heart-remedies. In physiological action it is allied to digitalin and other members of the digitalis group. It has been used, both experimentally on animals, and clinically in the wards, at the Infirmary at Edinburgh. The dose for hypodermic use is from one hundred and twentieth to one sixtieth of a grain. In the discussion which

followed the reading of Dr. Fraser's paper, Dr. Murrell pointed out that the introduction of strophanthin would serve to commemorate, in a way which would otherwise be impossible, the centenary of the publication of Withering's classical work on *The Foxglove and some of its Medical Uses.* (*British Medical Journal*, Aug. 8, 1885.)

**General Anæsthesia and Cocaine Mydriasis.**—Mr. Simeon Snell, of Sheffield, writes: I am not aware that any observations have as yet been recorded as to effects of the general anæsthetics on cocaine mydriasis. So much has, however, been written respecting this remarkable and most valuable drug, that it is hardly safe to state now that any observation is original. At all events, I desire to draw attention to the following. A short time since, cocaine was inserted into the eye of a case of strabismus, on which it was intended to operate, but for which it was afterwards deemed desirable to administer ether to overcome the nervousness of the patient. The phenomena about to be mentioned were not noticed. The cocaine had caused wide dilatation of the pupil; but, during the administration of the ether, and whilst under the anæsthetic, the mydriasis was observed to pass off, and the pupil to become just as small as the other. This observation has been repeated in other instances. A few days since, in a case of nævus of the orbit in a baby about to be treated with electrolysis, the pupil of one eye was purposely dilated with cocaine (five per cent. solution of hydrochlorate). Chloroform was then administered, and, whilst the child was getting under its influence, the pupil became less large, and when fully narcosed, it was as small as the pupil of the other eye. On the day this is written, the observation was repeated in a case for which ether was administered; and, after recovery from the effects of the anæsthetic (ether), the pupil was observed to have become dilated again. Mr. Coombe, assistant house-surgeon, has very kindly made observations, with similar results, in cases about to be operated upon by my surgical colleagues. It clearly follows, from these observations, that we have in cocaine a mydriatic that acts in a different manner from atropine and other agents of the same class. It is well known that atropine mydriasis remains unaffected when ether or chloroform is administered, a result in accordance with the opinion that the drug acts by paralysing the sphincter iridis, and affecting the muscles, or rather the peripheral endings of the nerves which supply them. The observations I have recorded would appear to support the theory advanced by Mr. Walter H. Jessop, in his paper read before the Royal Society, and alluded to in the *Practitioner* for January 1885, and the *Brit. Med. Journal* for June 27. He maintains that cocaine acts as an

irritant to the endings of the cervical sympathetic or mydriatic nerve of the eye. At all events, it is seen that, when, on the administration of a general anaesthetic (ether or chloroform), the muscular system has become relaxed, and narcosis has occurred, the cocainised eye recovers itself. These observations appear to be of interest, both apart from, and in connexion with, Mr. Jessop's interesting investigations. I am inclined to think that chloroform more fully overcomes mydriasis than ether. (*Brit. Med. Journal*, July 25, 1885.)

**Tuberculous Otorrhœa.**—The character of otorrhœas in phthisical patients has for a long time been recognised as peculiar, both in their beginnings and in their course. The beginning of the disease is painless, the first symptoms noticed being a rapid loss of hearing, soon followed by one or more perforations of the drum-membrane, unaccompanied by any marked inflammatory appearances on that membrane; these perforations rapidly enlarge, the membrane seeming to melt away without signs of ulceration, till often the whole membrana tympani is lost; this process is accompanied by but a slight amount of suppuration. Often the highest degrees of deafness are met in these cases, showing an involvement of the nervous structures as well as the tympanum. Healing in such cases is very exceptional, although it occasionally does occur from local treatment alone, and in other cases from local treatment combined with a residence in an appropriate climate. The absence of pain, the rapid destruction, the involvement of the labyrinth, and the character of the secretion have led to the suspicion that the disease is a specific tuberculous process, and Nathan has recently investigated a considerable number of cases to determine the presence of the tubercle-bacillus in the discharge. He examined forty cases of otorrhœa of all kinds, and in twelve of these found the bacilli in variable quantities. In eight of these twelve cases examination of the lungs and of the sputa proved the existence of tuberculous disease; in one such an examination was impossible; in the remaining three there were no symptoms outside of the ear pointing to tuberculosis, but caries was found in the ears. In the other twenty-eight cases of chronic and acute suppurations no bacilli were found. (*Deut. Arch. f. klin. Med.* vol. 35.) Although these observations of Nathan's seem to show that the presence of the tubercle-bacillus is of value in a diagnostic point of view, Gottstein asserts that such is not the fact; that in undoubted tuberculous otorrhœas the specific bacillus is sometimes present and sometimes not present; that its absence by no means justifies the exclusion of a tuberculous origin to the otorrhœa; and that a tuberculous otitis media purulenta resembles the tuberculous diseases of the

bones and glands in which it has been proved that the bacilli are present in but a small number of the cases. These observations are based upon his own studies and a review of the literature of the subject. (*Archives of Otology*, xiii. 1885.)

**Test for Digitalin.**—M. Lafon states that the following may be relied upon as a delicate and distinctive test:—Add to a mixture of alcohol and sulphuric acid, a drop of strong perchloride of iron solution. If even a trace of digitalin be present it will be indicated by a blue colour. (*Progrès Médical*, June 20, 1885.)

**Test for Codeia.**—This chemist also gives a characteristic test for codeia. A minute quantity, even a fraction of a milligramme of codeia, imparts a splendid green colour to a solution of one gramme of selenite of ammonium in twenty cubic centimetres of strong sulphuric acid. It appears that morphia is the only known alkaloid that gives anything like the same reaction. When selenium is dissolved in strong sulphuric acid, the green colour is the result; and codeia is said to have the power of setting selenium free from the ammonic salt. (*Lancet*, Aug. 15, 1885.)

**Anæmia.**—At a recent meeting of the Brighton and Sussex Medico-Chirurgical Society, Dr. Joseph Ewart read a paper on the anæmic state. This was manifested as an antecedent, accompaniment, or sequel, of specific fevers and “constitutional” diseases, of many local disorders, and of derangements which interfered with the nourishment of the blood or its depuration. As regarded the white and red corpuscles, it was probable that the same mode of genesis which led to their evolution in the blastema of the area vasculosa of the embryo, continued to insure their renewal and repair during their fully developed condition in thoroughly oxidised blood. Why should it be doubted that the red corpuscles possessed independent and self-reproductive powers? They were the analogues of the lungs, modified in structure, constitution, and distribution, so as to effect the interchange of oxygen and carbonic acid in the minutest recesses of the economy. The various phases of the anæmic state were then detailed; and, with regard to treatment, it was needful to note diathesis and temperament. In most cases, regulation of the bowels, improved hygiene, and open-air exercise, sufficed, especially if coupled with removal of the cause. In others, ferruginous preparations were demanded; the necessity of keeping the bowels free by means of salines in all cases of constipation being remembered. It had often seemed to Dr. Ewart, in managing malarial and other forms of anæmia, in which there was frequently manifested great intolerance of steel, that changing the particular preparation employed, a reduction of the dose,

or a diminution of the number of doses administered in a given period, sometimes sufficed to get rid of the fulness in the forehead, headache, indigestion, and gastric or intestinal irritation attributed to its use. But, in the main, in such cases, and they were numerous, perhaps the best plan was to give very minute doses indeed ; to assimilate them, in this respect, as much as possible to the condition in which they were found in chalybeate waters in a most diluted form, so that they might be taken between meals in large quantities of water during those periods of the morning and afternoon when out-of-door exercise could best be taken. In summer, Dr. Ewart invariably recommended such persons as could afford it to try the excellent chalybeate springs of St. Ann's Well, Brighton, Tunbridge Wells, or Harrogate ; or the pure iron waters of Schwalbach or Spa ; or the compound iron springs of Pyrmont, or St. Moritz, etc., under the direction of one of the physicians on the spot, and with the best results. Digestion, assimilation, and the nutrition of the blood, as regarded both albuminous material and the red corpuscles, were promoted by good but not too rich food, by drinking of the mineral waters, by open-air exercise, suited to the growing capabilities of the patient under the most agreeable surroundings of fine equable weather ; by brilliant sunlight, tempered by abundance of shade ; by society, and the best of music. The same mode of management was applicable to chlorosis, also, in anaemic Anglo-Indians, who had returned to their native country after long residence in or near the tropics ; but very free purgation to remove portal plethora in such patients was necessary when the treatment was conducted in this climate. In the winter there was often practically no alternative. But in summer it was better to recommend them to drink, first, the saline waters of Carlsbad or Homburg on the spot, and to wind up with a course of any of the chalybeate springs already mentioned. (*Brit. Med. Journ.* July 4, 1885.)

**Bacteriotherapy : a New Method of Treatment.**—Professor Arnaldo Cantani has turned to account the hostility existing between various microbes ; and, in the first case where the experiment has been tried, the *Bacillus tuberculosis* has been killed by causing the patient to inhale the *Bacterium termo*. The harmlessness of the *Bacterium termo* to healthy animals was first ascertained by giving it in various ways—by inhalation, injection, and by the stomach—to cats, dogs, and other animals. The case is briefly as follows. A woman, aged forty-two, with a large tuberculous cavity in the upper lobe of the left lung, was admitted to hospital on April 26th of the present year. Under quinine, cod-liver oil, and other restorative treatment, the patient was rapidly losing ground. The evening tem-

perature was between 100° and 101° Fahr. The expectoration was copious, purulent, and contained elastic fibres and abundance of tubercle-bacilli. Animals inoculated with the sputum became tuberculous. The body-weight of the patient steadily fell. On May 4th, all other treatment was stopped, and daily inhalations of the *Bacterium termo* were commenced; a rich culture in gelatine, diluted with meat-broth, being pulverised by means of an ordinary spray-producer. The expectoration diminished rapidly until it disappeared altogether. The tubercle-bacilli became fewer by degrees, being replaced by the *Bacterium termo*; and, on June 1st, the bacillus had entirely disappeared, and it did not again return. Animals inoculated with the sputum no longer became tuberculous. Meantime, the patient was gaining flesh, and improving in every way. Professor Cantani speculates on the possibility of finding, for every pathogenic microbe, a non-pathogenic hostile one. However, he very wisely does not lay great stress on a single case, nor does he pretend that the *Bacterium termo* is the best microbe to oppose to the *Bacillus tuberculosis*. Outside the body, the bacterium does not always kill the bacillus; and the two microbes are found together spontaneously in tuberculous cavities. In the case recorded, however, the conditions are different from those in which the bacillus has withheld the bacterium. The bacterium was given in large quantities, and in a vehicle that was perhaps more favourable to the bacterium than to the bacillus. (*Brit. Med. Journ.* Aug. 29, 1885.)

**The Pneumonia-coccus of Friedlander.**—Dr. George M. Sternberg calls attention to the so-called pneumonia-coccus of Friedländer, which, he claims, is in fact identical, specifically, with a micrococcus which he previously described, and which is found in normal human saliva, and with that found by Pasteur in the blood of rabbits which had been injected with the saliva of a child which died of hydrophobia in one of the Paris hospitals. This micrococcus he names *Micrococcus-Pasteuri*. The capsule, or mucous envelope, which sometimes surrounds this micrococcus, described by Friedländer in 1883, and photographed by Sternberg two years previously, cannot be accepted as a distinguishing character of this species, inasmuch as it is not constantly present, and the circumstances upon which its development depends have not been accurately determined. It is established that this is a pathogenic organism, as far as certain lower animals are concerned, and that its pathogenic power varies under different circumstances. It seems extremely probable that this micrococcus is concerned in the etiology of croupous pneumonia, and that the infectious nature of this disease is due to its presence in the fibrinous exudate into the

pulmonary alveoli. But this cannot be considered as definitely established by the experiments which have thus far been made upon lower animals. The constant presence of this micrococcus in the buccal secretions of healthy persons indicates that some other factor is required for the development of an attack of pneumonia; and it seems probable that this other factor acts by reducing the vital resisting power of the pulmonary tissues, and thus making them vulnerable to the attacks of the microbe. This supposition enables us to account for the development of the numerous cases of pneumonia which cannot be traced to infection from without. The germ being always present, auto-infection is liable to occur whenever from alcoholism, sewer-gas poisoning, crowd-poisoning, or any other depressing agency, the vitality of the tissues is reduced below the resisting point. We may suppose also that a reflex vaso-motor paralysis, affecting a single lobe of the lung, for example, and induced by exposure to cold, may so reduce the resisting power of the pulmonary tissue as to permit this micrococcus to produce its characteristic effects. Again, we may suppose that a person, whose vital resisting power is reduced by any of the causes mentioned, may be attacked by pneumonia from external infection with material containing a pathogenic variety of this micrococcus having a potency, permanent or acquired, greater than that possessed by the same organism in normal buccal secretions. (*Amer. Journ. Med. Science*, July 1885.)

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## Department of Public Health.

### THE RESULTS OF THE NOTIFICATION OF INFECTIOUS DISEASES.

*(Concluded from p. 233.)*

WE have now completed our examination of the reports of those medical officers of health in England and Wales who act for towns where the system of compulsory notification of infectious diseases is in operation.<sup>1</sup> In recording the results of this examination we have sought to give prominence to such matters as are essentially of medical concern, and which may be useful in respect to the extension of similar powers to other towns and districts. The opinions expressed have hitherto been almost exclusively those of officers already concerned in the administration of the law relating to notification, and in endeavouring to summarise them we desire still to emphasise the views of these officers, and to judge by consideration of the experience acquired in the districts which have been referred to, how far the opinions they have expressed are borne out.

The system of compulsory notification of infectious diseases must now be regarded as an important portion of our sanitary legislation, for though its application is only partial, yet so large a population is now subject to its provisions, and so steady is the increase in the number of towns to which the system is being applied, that it can only be a matter of time before the practice of notification becomes general. We have throughout limited our references to England and Wales, and it may be well to note,

<sup>1</sup> In the city of York the Act passed last year has only just been put into operation.

in this connexion, a statement which was issued in the Thirteenth Annual Report of the Local Government Board for 1883–1884, as to the sanitary districts in England and Wales which had up to the termination of the Parliamentary Session of 1883 acquired the needed powers as to compulsory notification. The statement runs thus:—“It will be seen that the system already applies to a population of more than two and a-half millions, about half this population, distributed among sixteen towns out of the thirty-four (above enumerated), being inhabitants of the single county of Lancaster. We may add that local bills applying similar provisions to Brighton,<sup>1</sup> Chester, Croydon, and Dewsbury, with an aggregate population of more than a quarter of a million, have been submitted to us prior to their introduction to Parliament in the session of 1884. In the event of these bills passing into law the system of compulsory notification will apply to about one-eighth of the extra-metropolitan population of England and Wales.”

I. *Method of acquiring the needed powers.*—It will be seen that in by far the majority of places where compulsory powers are in operation, the necessary powers have been acquired under Local Acts. This method is, however, in some respects cumbersome and, as a rule, costly; and it is therefore a matter of satisfaction that the Local Government Board, which is the Department charged with the administration of the Public Health Acts, has within recent years assisted authorities to procure enactments, similar to those in the Acts referred to, by means of Provisional Orders passed by their authority through Parliament.

II. *Diseases to be notified.*—In the earlier Acts there was a good deal of variety as to this, but since the issue of the Report by the Select Committee of the House of Commons on Police and Sanitary Regulations, 9th June, 1882, and to which reference was made in the first article relating to this subject at page 469, No. 198 (vol. xxxiii. No. vi.), the practice has been to follow the clause suggested by that Committee, and which runs as follows:—

“‘Infectious diseases’ means and includes small-pox cholera typhus, typhoid scarlet relapsing continued and puerperal fever

<sup>1</sup> In so far as compulsory notification of infectious diseases is concerned the Brighton Bill was not proceeded with.

scarlatina and diphtheria and such other disease as the Corporation under the provision and for the purposes of this Act may from time to time declare to be infectious."

Such a clause suffices for all ordinary districts, and in special localities only, as for example in towns where it is felt to be important to have the earliest possible information as to diarrhoea, will it be necessary at the outset to make any permanent addition to the list of diseases to be notified.

Erysipelas has in some instances been added to the list, but the experience obtained at Leicester, for example, is by no means favourable. A vast number of trivial cases of mere erysipelatous blushests, which have but little sanitary interest, appear to be reported, and in so far as isolation is necessary, it was found in one year that of 317 cases reported, only twelve were removed to the pavilion set apart for the reception of that disease. It must, however, be remembered that the pavilion in question is a miserable wooden shed.

*III. Attitude of the populations concerned towards compulsory notification.*—This subject can best be dealt with under two headings, *i.e.* (*a*) the Public generally, and (*b*) the Medical profession.

(*a*) *The public generally.*—There is no indication in the reports of medical officers of health that any feeling of opposition to compulsory notification, in its ordinary form, has been observed on the part of the populations generally, of the districts in which it is in operation. In some places there is, on the contrary, evidence to the effect that the system has been acknowledged to be of real value, and nowhere, in the reports we have examined, have we found that complaint has been made as to any violation of confidence, such as it was anticipated would be the case directly medical men reported to a sanitary authority the existence of infection in individual households.

(*b*) *The medical profession.*—The attitude of the medical profession in this country with regard to compulsory notification of infectious diseases is too well known to require more than the briefest reference here. The main body of medical practitioners consider that such notification is needed in the interests of public health, but there is disagreement as to the best method by which this should be carried out; a large majority maintaining

that the householder should be the channel through which the notification should be made, and an important minority, which largely consists of medical officers of health, contending that this duty can only be properly carried out by the medical practitioners in attendance on the cases. As matters now stand, the dual system of notification both by the medical man and the occupier is in force. The duty of notifying by the medical practitioner is general, but in some few places, as in Bradford, Norwich, and Nottingham, the medical man is only required to hand over to the occupiers the necessary certificates, and these occupiers are then responsible for transmitting the papers to the sanitary authorities. In nearly all other towns the occupier, as well as the medical practitioner, has to certify to the authority; but in some half-dozen places the occupier is relieved of this duty when a medical man is in attendance. In all recent Acts the duty of notifying direct to the sanitary authority has been cast upon both the medical practitioner and the occupier. Experience as to these various methods of practice will be referred to hereafter; but it is important to note what medical officers of health say as to the attitude of the medical profession after the compulsory clauses have come into actual operation. And, in the first place, it may be said generally that, even in towns where the opposition to the clauses was greatest, the system, when once it had become law, has been carried out with the strictest loyalty. Indeed, it is a common thing to read, in annual reports, expressions of thanks for the co-operation of the medical profession, and in many districts it is stated that no difficulty whatever had been met with. The exceptions are so few and far between that, were it not desirable to advert to them for the purposes of reference, they would hardly be worthy of record. So also they, as a rule, affect single individuals only, and nowhere has any organised medical opposition to the law, when once in operation, been met with. At Birkenhead some eight practitioners failed at first to report, but it is stated that the cases were mostly explicable. At Derby "one medical man" for some years placed himself in antagonism to the authority, but in this case the difficulty only related to the date when the notification was to be made, his contention being that, notwithstanding the requirement that the information was to be given "forthwith," he might send in his

certificates at the termination of the illness. At Jarrow, again, although it is reported, as the result of five years' experience, that no medical man was found to object to the principle of compulsory notification, yet some difficulty was met with in regard to a few practitioners, who held that it was not their place to specify the nature of the disease notified, and some legal proceedings were taken in consequence. These few instances sum up all the difficulties, in this respect, that we have met with, as worthy of record, in reports of officers of health; and it may hence be taken that the provisions in question are fully and readily complied with, by the medical profession, wherever they are in force.

*IV. By whom should the notification be made?*—We have already pointed out that the medical profession, as a body, have expressed the opinion that the occupier and not the medical attendant is the proper person to give to the sanitary authority the information needed. But the view taken by medical officers of health and sanitary authorities is evidently opposed to this. Mr. Iliffe, of Derby, has no hesitation in declaring that such a system would lead to an utter failure, and, as regards the classes who generally resort to the public stations for the vaccination of their infants, he cites the precedent that they are not entrusted with the certificates of successful vaccination, but that these are forwarded direct to the proper officer by the medical practitioner who holds the post of public vaccinator. So also at Huddersfield, where an amended Act was adopted, it appears that one of the changes inserted by the Parliamentary Committee was that the medical man should be directly responsible for sending in the certificates, and Dr. Cameron reports of this, that advantage has resulted, since the certificates are now received sooner than they formerly were. Where the dual system is in operation it is evident that no material importance is attached to the requirement that the householder shall report as well as the medical practitioner in attendance on the case, for the only instances in which proceedings have been taken against householders for failing to report are those where no medical man has been called in; indeed, apart from these cases, no attempt to enforce compliance with the Acts, on the householder's part, seems to have been attempted. And, again, in some districts where the

medical practitioner is only required to hand the certificate of notification to the occupier, it is reported that the practitioner has voluntarily taken upon himself the regular duty of transmitting the form to the authority or their officers.

V. *Are all cases duly reported?*—Dealing further with objections that have been made to compulsory notification, it becomes a question whether the authorities do really get certificates of all cases of infectious sickness, or whether the system leads the public to avoid calling in medical attendance, and to secrete their sick with a view of preventing the interference of the sanitary authorities. We are bound to say that, in so far as reports of medical officers of health may be taken as impartial upon such a point, we do not find that the Acts have, in any noteworthy manner, been defeated by such action. In some places, as at Birkenhead, all the cases were not reported in the first years after the Act came into operation; but Mr. Vacher, the medical officer of health, declares that any allegation to the effect that, judging from the number of cases reported, the mortality from the notified diseases tends to show an increase by reason of cases not being notified, has certainly not been borne out in his district. Failure to report every case is generally limited to the first years during which the system is put into operation. It has, however, also been noticed in districts where the sanitary authority have but little means of making use of the information when it is supplied to them, as, for example, at Norwich, where no proper means of isolation have been provided. But even there it is stated that the exceptions to the rule of compliance with the provisions of the Act are too unimportant to deserve notice.

Some officers refer specially to the question whether the Acts prevent people from sending for medical advice lest their relatives, &c., should be sent to hospital or otherwise interfered with by the authority, but they do not consider that any such result has been brought about. Mr. Butterfield of Bradford, whilst giving details of a single case where this did take place, states positively that no such effect has been at all general, and he, on the other hand, points out how parents, instead of sending for a medical practitioner, have at once notified the existence of infectious disease in their houses direct to the officers of the

authority, so that they might at once secure removal of the sick to the excellent hospital which is available in that borough.

VI. *Advantages of compulsory notification.*—There is a marked unanimity amongst all the medical officers of health of districts where compulsory notification is in operation as to the advantages that have resulted from the system. In the first place it is evident that efficient sanitary administration is facilitated by the early knowledge on the part of the medical officer of health as to the existence of infectious disease in his district. A vast amount of inspection of individual premises, together with the adoption of remedial measures, has been carried out, which could, under ordinary circumstances, hardly have been brought about by the strictest house-to-house enquiry, and measures of cleansing and of disinfection are resorted to in the earliest stages of many cases of infectious fevers, some authorities requiring that their officers shall at the onset provide the people with all the needed appliances, at times even with soap. Indeed it has been a matter of general comment amongst officers of health that the current work of their departments has undergone a material increase; and tables appended to their reports, specifying the amount of work carried out, bears out the statements made to this effect. Especially is this the case as to the number of houses and articles of bedding, clothing, &c., which have been cleansed and disinfected. Isolation in hospital has also been materially facilitated, and this under the best of circumstances, for the cases come to be heard of so early as, in most instances, to admit of the removal being effected before much risk of the diffusion of infection has come about.

In many reports a special point is made of the success attending the effort to prevent the spread of infection through the agency of school attendance. At Leicester, for example, the sanitary authority have a special form by means of which they immediately communicate to the school officers the occurrence of any notified disease amongst children, and this enables school committees and officers at once to exclude children coming from infected houses. So also, a second form is sent in announcing the fact that the danger of infection is over, and that the scholars may return to work. At

Newcastle-upon-Tyne, Salford, and other places school attendance is similarly controlled by the aid of an early notification. In some districts, where special powers have been acquired, further action in the interest of public health is facilitated, such as the closing of dairies and shops, and the provision of temporary shelter for persons who are apparently healthy but who are residing in tenements where fever, &c., occurs. This latter action has, for example, been taken at Jarrow. A general education of the public in some of the first principles of health is also believed by some officers of health to have been materially promoted since the Acts came into operation. Seeing, as householders and others do, the care taken by authorities and their officers to control the spread of infection, they come to learn the value of such action and the method of carrying it out. Mr. Butterfield, of Bradford, reports that since the Act came into operation in that borough he has observed a great diminution in the carelessness which was formerly exhibited by people in the matter of infectious diseases, and the inhabitants are not only now more willing than formerly to make use of a fever hospital, but they seem themselves to have acquired a keener sense of their own responsibilities in the matter of preventing infection. Much the same is said by Dr. Johnston of Leicester, and by officers of health in other districts.

The surest test of the advantages attendant on the system of compulsory notification will necessarily be sought in evidence of a diminution in the mortality from the diseases notified in the districts where the Acts are in operation. But here it must at the outset be admitted that the materials available for the purposes of the necessary investigations are, in so far as the annual reports of medical officers of health are concerned, scanty in the extreme. In the first place, no sufficient records are in many districts prepared to admit of a judgment in the matter. In others, the period which has elapsed since the adoption of the system of notification is too short to warrant any general inference, and even where statistics for a series of some five years before, and subsequent to the passing of the Special Acts, can be prepared from the reports, many sources of error have to be eliminated. Thus, quite apart from notification, general sanitary measures known to diminish the fatality from the preventible

fevers have often been largely adopted ; or an epidemic of a disease tending only to recur at somewhat distant intervals may have just subsided or just commenced before notification was brought into operation, &c. Remembering these and other sources of error we may, however, note the results which are reported in several districts. In doing so we use the same statistical methods adopted by the reporters, and we revert, amongst other things, to the rates from the group of so-called " zymotic diseases," a group which unfortunately includes diseases having but little in common, and also some which can hardly be controlled by sanitary measures.

At Bolton the average general mortality had fallen from 25·9 to 21·1 per thousand, and the percentage of deaths from the " seven principal zymotic diseases" to total deaths from 20·2 to 17·0. At Derby it will be seen that the average general mortality had diminished from 22 to 19 per thousand, and that the proportion of deaths from scarlet fever and diphtheria<sup>1</sup> to a thousand deaths from all causes had fallen from 56·5 to 24·8, and from 2·0 to 1·1 respectively, that from continued fever remaining much the same, and that from small-pox having slightly increased. At Huddersfield comparison between three years before the passing of their first Act and three years subsequent to the passing of their amended Act shows the following in rates per thousand. As regards the general death-rate a diminution from 22·7 to 21·5 ; as regards small-pox a diminution from 0·07 to 0·00 ; as regards scarlet fever, a diminution from 0·94 to 0·18 ; as regards diphtheria from 0·12 to 0·05, and as regards "fever" from 0·35 to 0·16. At Leicester the general mortality rate had fallen from 24·3 to 21·4 per thousand, that from the "principal zymotic diseases," as a group, and that from scarlet fever had not undergone diminution. At Norwich the average general rate of mortality had fallen from 22·7 to 20·8 per thousand, but statistics are not available for further comparison. At Oldham the general mortality had slightly fallen ; namely, from a rate of 23·9 to 23·0, and " zymotic diseases" from 4·0 to 2·2 per thousand. At Reading the general rate of mortality had fallen from 18·4 to 16·8, and the rate from " zymotic diseases" had shown a trivial decrease from 2·8 to 2·5

<sup>1</sup> As to this see, however, vol. xxxiv. p. 156.

per thousand. At Salford, again, the general death-rate had fallen from 23·3 to 22·0, and the "zymotic" rate, which stood as high as 3·8, became 3·6. Consideration of the statistics quoted makes it most difficult to draw any general inference from them. As regards individual infectious diseases, there can be no question but that early notification in the case of small-pox has almost everywhere tended to prevent its spread, and this even where the means of isolation provided by sanitary authorities are of the most imperfect sort. Much the same may be said of typhus. But, as to scarlet fever, the matter is often different, and the instances of Leicester and Warrington are especially to the point. On the whole it will probably not be safe to attach much importance to data which hardly admit of comparison, and which often only involve a period of a few years only.

VII. *Reasons why the Acts have failed.*—In some towns, and this notwithstanding the opinions expressed in annual reports, it is difficult to see that any great advantage has, as yet, followed the notification of infectious diseases. Foremost amongst the reasons for failure is the absence of any provision by the sanitary authority for the isolation of the diseases of which notification is required. Evidence of this is shown in the case of Bolton, where the Act requiring notification long preceded the provision of a hospital, and where scarlet fever continued to cling to the place notwithstanding the early knowledge that the authority had as to the existence of each case as it occurred. Again at Blackburn, the "zymotic" rate had been very high for the four years, 1880-83, during which notification had been carried out, and where, apparently, small-pox is the only disease isolated by the authority. In Derby, too, although the occurrence of a very wide epidemic of scarlet fever in 1879, the year in which the Act was first adopted, and which is put to the credit of the period antecedent to the Act, tends to show that a diminution has taken place in that disease since compulsory notification was adopted, yet, as a matter of fact, the disease has, since 1880, been largely prevalent, and this occurrence can hardly be dissociated from the deterrent and imperfect sort of hospital provided by the authority.

Much the same influence may be said to have been obtained

at Blackpool, Bury, Jarrow, Macclesfield, Norwich, &c. In the latter place, for example, there were in the four years 1880-83, as many as 1,526 cases of scarlet-fever notified, and of these only thirty were isolated in hospital. Scarlet fever is essentially the disease that in England calls for early isolation, because no other efficient remedy against its spread exists. Hence this disease has been specially quoted. But in the towns referred to the same want of isolation exists as regards most of the other infectious fevers, and it becomes almost a matter of surprise that authorities should care to possess the knowledge of the existence of the individual cases of disease, when they continue year after year to see those diseases prevailing, and they themselves fail to make what must be regarded as the most important provision against their extension.

On the whole, the story of the results of the adoption of compulsory powers for the notification of infectious diseases, as told by medical officers of health, goes to show that, as a rule, these powers tend very markedly to the advantage of public health, and it may reasonably be expected that, after a lapse of sufficient time, evidence as to this may be obvious in the mortality statistics. If this is to be the case, all authorities seeking or possessing such powers should allow no delay to occur in making the needed provision for dealing effectually with the cases notified to them.

# THE PRACTITIONER.

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## Original Communications.

### THE TREATMENT OF ALBUMINURIA.

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THE therapeutics of albuminuria, if dealt with in any detail, would far exceed the limits of an article for the *Practitioner*. In no disease is the personal factor of more importance ; in none do the individual tendencies and peculiarities of the patient's constitution necessitate more frequent or wider apparent deviations from the general line of treatment sanctioned by physiology and by clinical experience. I have used the term albuminuria rather than renal disease, because in many cases, *e.g.* in intermittent or cyclic albuminuria, it is difficult to believe that there are any organic changes in the kidneys ; whilst, excluding new growths, the cases in which organic changes exist without albuminuria are probably few and unimportant. The two terms are by no means coextensive ; and albuminuria includes under it a greater number of cases fit for medical treatment than does renal disease. It will be convenient to begin by a brief notice of cases which it is, or may be, possible to cure, in the old-fashioned sense of the word, *i.e.* to undo and remove the effects of the pathological processes which underlie disturbances of function, and this by some more special treatment than mere attention to the general health.

There are certainly two forms of kidney disease in which this ought to be within our power, viz., syphilis and nephritis, glomerular or not, due to the presence of micro-organisms, as in diphtheria, and probably in scarlet fever. No doubt syphilitic lesions also are brought about in similar ways, and depend upon the same kind of cause, but the great importance of syphilis, from its frequent occurrence, makes it practically convenient to separate it as far as possible from allied forms of disease. From the therapeutical point of view, the most important thing in syphilitic cases is to arrive at an early diagnosis. For some weeks at least after their beginning, specific lesions in the kidneys, as in the nervous system, are very often capable of being completely, or all but completely, cured. After a time, however—and the danger rapidly increases with the length of the period during which they are allowed to proceed unchecked—their interference with nutrition, by constriction or obliteration of vessels, brings about secondary degeneration, fatty or fibroid, with corresponding destruction of normal tissues, and these are no longer remediable. The varieties of syphilitic lesions affecting the kidneys are many and various in their relation to the nutrition of the organ, and consequently also in their effects upon its function, and it is no doubt frequently impossible to arrive at a certain diagnosis. But whenever the symptoms of disease, especially albuminuria, declare themselves simultaneously with the outbreak of secondary syphilitic rashes or nodes, or even if this take place about the period, after the primary infection, when secondary lesions usually make their appearance, then it is wise not to be too curiously minute as to the certainty of the diagnosis, but to try at once the effects of iodide of potassium given in increasing doses, or of perchloride of mercury. If syphilis be the cause of the trouble, improvement will soon begin, if it be not, but little if any time will have been sacrificed; whereas if the remedies available against other forms of nephritis, slow as they are in their operation and at best of doubtful efficacy, be first resorted to, all chance of restoring health or even of prolonging life may have been lost.

With regard to other forms of infective disease, especially those which occur in connexion with scarlatina and with diphtheria, if we remember that a drug which is excreted by the

kidneys undergoes more or less concentration in those organs, there seems to be fair ground for hope that sooner or later some means may be discovered of destroying the micro-organisms, whether they be lodged in the glomeruli or elsewhere. I have myself used the salicylate of sodium in scarlatinal nephritis, and apparently with some benefit, but the cases are yet too few to justify any more satisfactory conclusion than encouragement to persevere in the use of this or of some similar remedy; and further, it has to be remembered always in estimating the value of therapeutical statistics in this particular instance, that the great majority of patients, if strictly confined to bed, get perfectly well under treatment by almost any drug (alkalies, acids, antimony, iron, digitalin, veratrum viride, &c. &c.) which is not given in poisonous doses.

But in default of any special mode of treatment, both in these and in the common forms of albuminuria which come under the notice of the physician, we must fall back upon the general principles which ought to guide us in the management of diseases of the kidney, and endeavour to ascertain how far and in what direction these principles require to be modified, in order to meet special forms of disease and the idiosyncrasies of those who suffer from them.

There is one prime indication which ought never for one moment to be forgotten throughout the entire course of any case of renal disease. It is that the kidneys are, for the time at least, unequal to the function which, as specialised members of the organism, they have to perform, and whatever else we do we must perseveringly endeavour to adjust the calls made upon them to their diminished powers. In this way only can we hope to restore the lost balance between nutrition and function, and give the damaged organs the opportunity of regaining their normal condition. There are two main lines of treatment, by either of which this indication may be more or less satisfactorily fulfilled.

1st. We may reduce to a minimum the work which they must perform.

2nd. We may stimulate other organs to undertake some part at least of that work.

But we must never lose sight of either; our success in any

particular case will depend entirely upon the skill with which we can combine the two to meet its special requirements.

There is a third subsidiary method, which, from time to time, we shall be compelled to adopt, but its employment should be temporary only, and even then requires the soundest judgment, the most thorough knowledge of the state and capabilities of the patient. We may endeavour to stimulate the disabled kidneys themselves to increased activity, that they may earn, so to speak, a period of rest by getting rid of accumulated arrears of work. The danger in attempting this, and it is a very real one, lies in our misjudging the amount and kind of stimulation which may be safely employed; if we blunder here, then increased activity will be surely followed by increased, perhaps fatal, exhaustion.

There are several ways in which the amount of work may be lessened.

Every muscular movement, every development of bodily and mental energy, contributes its share to the work which has to be performed by the kidneys. From this point of view we arrive at the common-sense conclusion that the patient must refrain from every needless effort, that he must avoid everything which unduly increases the disintegration of his tissues, whether that disintegration be the result of functional activity, or is necessary for the maintenance of his normal temperature. Rest and external warmth are alike essential to his well-being. The only safe place for even moderately severe cases of albuminuria is in bed. I prefer to state this absolutely for the present, although in practice it requires some modification. Again, the strain upon the kidneys may be lessened by reducing the amount of food, and especially of nitrogenous food, to the moderate quantity which is really required. And it is the more necessary to attend carefully to this point because his own feelings are by no means safe guides to the patient. I never cease to wonder at the physiological paradox presented by so many renal patients. With all their tissues water-logged, with their serous cavities occupied by effusions, and this state of things brought about by serious concurrent damage in organs necessary to life, and a change in the chemical and physical properties of the blood which would seem to make even bare life impossible, they still

say, and with evident truth, that they feel perfectly well, and have excellent appetites, the only slight ailment which they reluctantly confess to being perhaps slight gastric and intestinal flatulence. The final solution of the paradox must be left to the physiologist. Meantime, and as a working hypothesis, the result of Bernard's experiment on the behaviour of the alimentary canal after extirpation of the kidneys, viz., that it then contains not urea but an unusual quantity of comparatively harmless substances—the derivatives of urea—does explain, and is confirmed by, clinical facts of every-day occurrence. Anyhow this delusive feeling of health, and especially of hunger, is a very great difficulty in the dietetic treatment of those cases, and they are many, in which it is present. Far from being content with his usual allowance of food, he craves for more. It may even be that as an ill-constructed furnace requires a larger quantity of fuel to produce a given effect, so his damaged powers of assimilation and nutrition cannot meet the wants of his system without an increased supply. It is often impossible to diminish, in any great degree, the bulk of his food, but his cravings may still be safely satisfied by substituting for articles which are rich those which are poor in nitrogen. Flesh food ought not to be taken more than twice in the twenty-four hours, and then only in very moderate quantity, and milk, when it can be digested, is better than beef-tea.

But it is not sufficient to diminish the quantity, or to alter the quality, of the food : we must also endeavour to secure as far as possible its perfect digestion. For this end bitter substances, especially strychnine, acids and alkalies, are most useful, the selection of the drug being determined, not by any *à priori* theory, but by careful watching of its effect ; and at the same time by the use of an occasional purgative the prolonged retention of imperfectly-digested matter must be prevented—for the products of the incomplete oxygenation of albuminous substances passing into the blood are more injurious than urea itself. And here a question arises, to which no general answer can be given, viz., how far strict confinement to bed may interfere with the functions of digestion and assimilation. In each case we must be guided, not by preconceived notions of the efficacy of the means we employ, but by their actual effect. Moderate exercise, if it

can be taken without any risk of a chill, is now and then beneficial. Even in severe cases it may be better for the patient to walk up and down his room for a few minutes, two or three times in the day, than to remain constantly in bed. Of course care must be taken that exercise, whilst it gently stimulates the digestion, circulation, and respiration, does not lead to any great increase of tissue change. For in the same way that some slight effort, from which the healthy would derive nothing but good, proves fatal to the sufferer from heart disease, so a slight addition to the amount of effete matter in the blood, which would be a beneficial stimulant to sound kidneys, will bring on fatal suppression of their function when they are unsound.

The organs of whose increased activity we can best avail ourselves to supplement the failure of the kidneys are the skin and the intestinal canal.

The steady warmth of bed is the best of all means for maintaining a continuous and slightly greater excretion of blood impurities through the skin; and its effect will be all the more satisfactory if the surface of the body be daily sponged with tepid or warm water by a skilful nurse. If well-trained service is not at hand the sponging ought not to be attempted. At the same time some simple saline draught, containing fifteen or twenty minimis of antimonial wine, three or four times a day, or a dose of the pulvis antimonials at bed-time, are often of great use. When more profuse diaphoresis is required, the hot-air bath, or the subcutaneous injection of pilocarpin, will best serve the purpose.

Purgatives and diaphoretics have two distinct uses in the treatment of renal disease. They are employed—

1st. To promote a slightly increased continuous activity of the skin and intestines. With this object they must not be so given as to produce any excessive effect, for such effect is followed by exhaustion of the organs on which they act, which may make it impossible for a time to get from them even the normal amount of work.

2nd. To obviate urgent symptoms of uræmia; and here they must be used freely, the immediate danger must be averted at all hazards, and the subsequent injurious effects of our remedies

must be met as they arise—and it is well to remember from the first that these effects *are* often injurious.

It may be said that I have occupied too much space in the discussion of common, well-known matters. I have done so, because though trivial—perhaps because they are trivial—they are often neglected, although by themselves they are more potent for good than any drug treatment would be without them. They are also by no means easy to carry out, unless those who should enforce them are themselves convinced, and can convince their patients, of their efficacy. They are the necessary basis of all treatment in this class of diseases. But starting from the vantage-ground which they give us, there is still ample room for the employment of the resources of all the pharmacopœias.

(*To be continued.*)

# ON THE PHARMACOLOGICAL ACTION AND THERAPEUTIC APPLICATION OF SOME ETHEREAL SALTS OF CARBAMIC ACID.<sup>1</sup>

BY O. SCHMIEDEBERG.

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(Continued from p. 280.)

*Action of Urethane on Mammals and Birds.*—The effects of urethane on mammals and birds are perfectly analogous to those on frogs. The blunting of the cerebral functions comes sharply and prominently to the front, and more especially the manifestations of volition are lessened in intensity, and the susceptibility to sensory stimuli is greatly diminished, while painful stimuli still retain their full power for a long time.

In these animals, as in frogs, the slighter degrees of action are hardly perceptible externally. After the administration of one grammie of urethane by the stomach to rabbits, they retain their normal sitting or couching position, react tolerably briskly when seized, but soon become quiet, and will then remain for almost any length of time completely quiet and motionless in any position or posture into which they are put, however unusual or unnatural it may be. They remain lying perfectly quiet and motionless on their backs, and when they are placed upright, with their backs leaning against a wall, or their forelegs slightly supported, they will remain a long time on their hind legs without sinking down. The acme of this stage of action is indicated in rabbits by the occurrence of a peculiar rigid immobility, which can only be interrupted for a short time, and frequently with difficulty, by strong external stimuli. It may be

<sup>1</sup> This paper is translated from an early sheet of the *Archiv für experimentelle Pathologie und Pharmacologie*.

compared to true *cataleptic conditions*, for in it just as in catalepsy, each limb will remain in every possible position in which it has been placed.

This catalepsy occurs still more easily and more markedly in pigeons after half to one gramme of urethane. When the right dose to produce well-marked catalepsy without general relaxation has been hit exactly, if we hang the pigeon up by the beak and put the wings into the right position it cannot possibly be distinguished from a dead one by its appearance. As soon as we throw it into the air, and the outspread wings meet with the resistance of the air, powerful flying movements occur but only last for a short time, and then the pigeon sinks to the ground and remains quietly lying on the spot.

In dogs a distinct cataleptic condition was not observed. Middle sized animals, after the administration of from 1 to  $1\frac{1}{2}$  grammes of urethane by the stomach, exhibit only a greater desire for rest, and like to remain lying in one spot, though there is no sound sleep. Doses of 2 to  $2\frac{1}{2}$  grammes produce a staggering gait and a great tendency to sleep, from which, however, they can be easily awaked. During this stage no other symptoms occur, except that in several cases the animals shivered throughout the whole body while lying, although it was impossible that they could feel cold. After 3 or 4 grammes sleep is generally no sounder, but rather lighter than after smaller doses, apparently in consequence of an irritation in the medulla oblongata, and perhaps in the spinal cord, beginning to take effect.

In higher degrees of the action of urethane enfeeblement of voluntary movement becomes associated with dulness of the cerebral faculties in mammals as well as in frogs. After  $1\frac{1}{2}$  to 2 grammes have been given to rabbits they are no longer able to retain their ordinary sitting position, but sink down quite limp, and lie flat on their belly with their legs stretched out. External stimuli are responded to by feeble movement only.

In dogs the injection of larger quantities of urethane into the stomach easily produces vomiting, while, on account of the large quantity of fluid required, the subcutaneous injection is very inconvenient, and perhaps not quite adapted for obtaining definite results. On this account the experiments on the

highest non-lethal degrees of the action of urethane, which essentially correspond to the narcosis produced by chloral and chloroform, were performed almost exclusively on rabbits. It was, however, ascertained that, as was to be expected, no new phases of action of any importance occur in dogs. I may only mention that half stupefied dogs, just as in imperfect chloroform narcosis, frequently make energetic movements with their legs lasting some time, even when they are already lying on their side and no longer able to move from the spot.

Deep narcosis occurs in rabbits after an average dose of 3 grammes, and lasts for about two days.

Consciousness, sensation, and movement, both voluntary and reflex, are completely suppressed exactly as in narcosis from chloroform or chloral, &c. On the other hand the respiratory movements not only remain up to the normal, but they become very considerably increased both in frequency and depth. As the respiratory centre in this stage of the action of urethane is completely removed from the influence of all external stimuli, and as the circulation has undergone no material change, the alteration in the respiration can only be due to direct stimulation of the respiratory centre. This action is to be referred to the  $\text{NH}_2$  group in the urethane, a group which in fact retains its character in this combination also.

The stimulating action of urethane on the respiration is so considerable that sometimes the slow and shallow respiratory movements of chloralised rabbits may be rendered distinctly deeper and quicker by it.

As I have already remarked, the circulation suffers no essential impairment even in deep narcosis from urethane. The heart beats forcibly and the blood-pressure remains nearly at its normal height.

In one case the normal blood-pressure in a rabbit was 112 millimetres of mercury; after the gradual intravenous injection of two grammes of urethane, it sank to a mean of 106 millimetres, and after 0·8 gramme more it only sank to 100 millimetres. While in this experiment 2·8 grammes of urethane only caused a slight fall in the blood-pressure, 0·5 gramme of chloral-hydrate under similar circumstances causes the blood-pressure to fall to less than half the normal.

In one experiment three grammes of urethane were injected into the stomach. Shortly afterwards the narcosis already described came on. After four hours the blood-pressure was measured. Immediately after the connexion was made between the kymographion and the artery, the blood-pressure was eighty-six millimetres; it then rose gradually and without the smallest oscillations, and after half an hour had reached the height of 101 millimetres, which is quite normal.

These examples are sufficient to illustrate the fact that urethane, especially as compared with chloral-hydrate, hardly affects the blood-pressure at all. This difference between the two substances is to be attributed to the fact that chloral-hydrate, like other halogen compounds of this group, has a powerful paralysing action on the vaso-motor centres, while urethane has no paralysing action on them, although a stimulant action on them like that on the respiratory centre is not perceptible.

Regarding the action of other ethereal salts of carbamic acid, I will only communicate at present the following short preliminary notes. Complete comparative researches with various simple and substituted ethereal salts of this acid are already in progress and the individual data which they yield will serve as a basis for determining the indications for the practical application of these compounds. In correspondence with the fact already mentioned that in ammoniacal bases the hydrocarbon groups do not exhibit their narcotic action, we find that in urethane its activity is not perceptibly increased by the substitution of hydrogen in the  $\text{NH}_2$  group. No doubt definite results in this respect are to be obtained only by comparing those compounds which are easily soluble in water. Amongst the substituted urethanes the ethyl salts of methyl- and ethyl-carbamic acid belong to this class. The differences between their action and that of urethane appear to be no greater than those which occur in different experiments on animals of the same size and of the same kind with the same doses of urethane. The question, which we have hitherto hardly glanced at, now arises, whether the statements regarding the activity of such compounds which as already discussed are equally composed of several parts should be based upon similar weights or upon molecular weights? For example, if the narcotic action of

urethane depends entirely on the atomic group  $C_2H_5$ , and if the entrance of this or of another hydrocarbon into the group  $NH_2$  does not affect its activity, then, in correspondence with the molecular weights of the compounds, 105 parts of the substituted compound will not act more powerfully than 77 parts of the original urethane. In the opposite case one would have to conclude that the hydrocarbon which had been introduced and attached to the N takes a part in the action. But as it is very difficult to determine the strength of such actions with certainty, especially in their earlier stages, these relationships can only be elucidated by a great number of comparative experiments. Amongst the ethereal salts of carbamic which contain the next higher homologous hydrocarbons to ethyl, the propyl, isobutyl, and amyl ethers are easier to prepare and have already been introduced into commerce by Messrs. Kahlbaum. The propyl ether appears to act in the same way as urethane, but smaller doses are required to produce the first degree of narcosis up to commencing enfeeblement of voluntary movements. The two other ethers which I have mentioned have not yet been fully tested. Their insolubility in water hinders their absorption and renders it difficult to judge of their action. They have, therefore, been reserved for further observations.

(*To be continued.*)

## SHORT NOTES ON THERAPEUTICS.

BY H. MACNAUGHTON JONES, M.D., F.R.C.S.I. AND EDIN.

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(Continued from p. 261.)

### AURAL THERAPEUTICS.

I. Before drawing some obvious inferences from this classification I think it will be well to supplement it by reference to another table, previously published, of 1,500 hospital patients. I cannot pretend that it is in any way as accurate a record as that of my private patients. It is simply compiled from the register of patients who attended the hospital, the special affection tabulated being that noted by myself or my clinical clerk in the extern department which was registered as the most prominent morbid condition at the time relief was sought. It was impossible to make a more accurate analysis, as most of the letters of the patients were lost, mislaid, or not returned. Though only seventy-one cases have yet been tabulated as suffering from affections of the internal ear, it is clear that when so large a number as 466 had chronic catarrhal conditions and complications present in the middle ear, such as adhesions, ankyloses, &c., the internal ear must also have been, in many instances, involved. Again, patients who had polypus growing from the tympanum or membrane have not been separated from those in whom it grew from the meatus. Lastly, 105 cases have been merely placed under the head of "Affections of the Middle Ear." Still I consider it sufficient of an index to the abnormal states of the ear we are called on to treat in every-day practice to induce me to make use of it, as well as the record of my private cases.

Let me note here that one-fifth of the 1,500 hospital patients had cerumen, or accumulation of cerumen with epidermis, or

both, with aspergillum present in the meatus. This corresponds pretty closely with the proportion in which cerumen was found in the meatus in the 500 private patients. Again, if we take the entire number of the 1,500 in which the principal mischief was discovered in the external ear, we find it to be (deducting polypus) 645 as against 210 of the 500, and while inflammatory states of the meatus with furuncle or abscess were present in one-tenth of the private patients, these conditions are noted in one-fifth of the hospital ones. The difference in the mode of drawing up these tables makes any further just comparison impossible. But it may be well to notice that both tables agree in demonstrating the large number of patients of all classes who suffer from perforation of the membrane, obstructed and collapsed conditions of the Eustachian tubes, and catarrhal complications of the tympanum. On the other hand, it is important to observe that of these 2,000 patients true exostosis in the meatus was present in only eighteen, that but forty-two were seen in the early stage of acute inflammation of the membrane, and that in this number only was it possible to isolate the inflammatory state of the drum-head as the cause of pain, while about 5 per cent. had a polypoid growth either in the meatus or middle ear.

External ear .....	645
Middle ear, including the membrana tympani, cavity of tympanum, and Eustachian tube .....	716
Polypus (either of meatus or tympanum).....	61
Internal ear .....	71
Mastoid process .....	7
	<hr/>
Total.....	1500

Analysing still further the causes of deafness in these patients I find as follows:—

*External Ear and Meatus.*

Cerumen (with epidermis and aspergillum in some instances) .....	present in	295
Tumour of auricle .....	,,	5
Injury of auricle .....	,,	4
Congenital abnormalities of auricle.....	,,	4
Absence of meatus.....	,,	1
Foreign bodies .....	,,	18
Inflammatory states of the meatus.....	,,	179
Furuncle and abscess.....	,,	88
Exostosis.....	,,	5
Eczema .....	,,	46

*Middle Ear and Eustachian Tube.*

Myringitis.....	31
Catarrhal states of the tympanic cavity .....	202
Collapse, closure, and obstruction of the Eustachian tube from various causes .....	159
Unclassified affections of the middle ear .....	105
Membrana tympani perforated in .....	218
Polypus of external or middle ear.....	61

*Internal Ear and Labyrinth.*

Affections of (registered).....	71
Mastoid process.....	7

There are some broad conclusions which may, I think, be immediately stated when we glance over the tables I have submitted.

(1) That a very large proportion of the aural affections for which we are consulted, both those of an inflammatory character and those in which there is deterioration of function, are due to essentially preventible causes, or causes over which the controlling influences within the reach of every physician and surgeon can be exerted so as either to prevent or minimise their pernicious effects.

(2) That the external ear furnishes over 40 per cent. of the diseases we are called on to treat, and that (to take a low estimate) in some 40 per cent. of these patients cerumen (and its associated and attendant evils) is the primary cause of the trouble, and produces the symptoms for which we are consulted; and that of the remaining affections of the external ear, inflammation of the meatus, in various degrees and stages, is the condition we have most frequently to combat and limit.

(3) That chronic, dry, or moist catarrhal states of the middle ear furnish the next largest number of patients, associated with which we frequently find closed, obstructed, or collapsed Eustachian tubes. Of the 2,000 patients tabulated, more than one-third distinctly came under this head, and in over one-third of these closure or obstruction of the Eustachian passage was registered. But this, as I have already shown, is to be regarded as only approximately accurate, as in the classification of a large proportion of these cases the secondary condition has not been included. This applies more particularly to the hospital register. I should say that at least two-thirds of these

"middle-ear" cases were complicated with, or owed their intratympanic mischief to, Eustachian collapse or closure. We may also, I think, draw this general conclusion, which has an important bearing on aural therapeutics, viz., that the practitioner in daily practice has principally to deal with two causes of inflammatory affections of the ear and deafness; in the external ear accumulation of cerumen and its accompaniments, epithelium and fungus; in the middle ear tubal collapse and closure and obstruction. Side by side with this inference I would notice the number of cases of perforation, both acute and chronic, of the drum-head. Perforation was present in 132 ears out of the 500 private patients: and 218 of the 1,500 hospital cases had an opening in the membrane of one or both ears. This would represent over 17 per cent. of the entire number of patients as having had a perforation of the membrane in one or both ears.

Before entering into some special details of therapeutical remedies, I would conclude these introductory observations by a reference to the manipulative experience and dexterity necessary in the application of local remedies to the external and middle ear. This experience is, I repeat, easily to be gained by the ordinary intelligent practitioner, and is not a whit more difficult to attain than the acquisition of the corresponding dexterity and gentleness of touch which should be exercised in various other surgical procedures—as, for example, the manipulation and treatment of the sensitive urethra. It has certainly to embrace the ability for careful and accurate determination of the condition, normal and abnormal, of the external ear passage and the nature of its contents; the ready recognition of the appearance and slight anatomical deviations from the typically normal shape, colour, position, of the membrane, and which anatomical peculiarities are found in a certain proportion of ears in which the hearing power is perfect. On the other hand, he must be familiar with the alterations presented in the shape and position of the drum-head, when it has been subject to repeated catarrhal attacks, and in cases in which there have been chronic catarrhal conditions of the middle ear, conditions which induce rigidity of the ossicles and their articulations, with corresponding alterations in the tone and degree of tension of the intrinsic muscles, and accumulation of mucus in the tympanic cavity—all of which departures favour the

approach, and induce the occurrence of lesions of the internal ear and its delicate nervous apparatus. Acquaintance with the use of three appliances is here essential. They are diagnostic. These are the speculum, the otoscope, and tuning-fork. And when the physician comes, both for purposes of diagnosis and treatment, to apply remedies to the Eustachian tube and middle ear, he has to acquire the method of passing the Eustachian catheter with facility and gentleness. Both with mirror and finger he should know how to explore the naso-pharynx ; the number of naso-pharyngeal cases in which we find deafness an accompanying trouble necessitating this knowledge, not alone for the ear but for the treatment of attendant nasal and throat affections. The nasal speculum, the laryngoscopic or rhinoscopic mirror, and a tongue-depressor are not difficult instruments to master the use of. On the method of applying therapeutical remedies I shall shortly touch, in alluding, as I must necessarily do, very briefly, to those agents of the action of which, from their repeated use, I have had myself the greater knowledge. It will be noticed that the proportion of internal ear affections appears from the registered number of cases, 184 out of 2,000, to be relatively small. But this is to my mind the most misleading inference which we can draw from any statistical table or classification of ear affections. To assign a well-marked case of nervine deafness, labyrinthine vertigo, the combination of objective signs and subjective symptoms, which we group together under the name of Menière's disease, or those numerous cases in which from disease or accident we can have no doubt that permanent lesions, traumatic in origin or the consequence of apoplectic, acute inflammatory, or degenerative changes in labyrinth or cochlea, to the division of internal ear disease, is an easy task. But to accurately differentiate these morbid conditions, such as true paralytic states from localised nerve lesions, limited effusions of blood or serum, simple functional disturbance and paresis from organic mischief in the nerve elements, is, we have to confess, in the present state of our knowledge and the scanty clinical and pathological data, generally impossible. This is the weak side of otological science, and an unfavourable comparison can justly here be made with ophthalmological research and knowledge. But it is established by all past

pathological evidence that serious lesions of the middle ear—take especially suppurative catarrh with extensive perforation in the membrana tympani, and old catarrhal conditions of the membrane of the cavity of the tympanum—lead up to and are attended by varying degrees of internal ear mischief both in the labyrinth and cochlea. And, therefore, in such a classification as that which I have presented it must have happened, and the general experience of the results of treatment prove this to be true, that the internal ear structures were likewise, to an extent, involved though not included at the time. How far such involvement depends on constitutional or systemic states and on morbid changes in other organs, to acute disease or general decay, apart from these middle-ear affections it is our obvious duty to try to determine. At times the attempt is an impossible one; at other times the more remote source of the symptoms is immediately obvious. Under any circumstances it does not affect our duty to determine the part taken by the local lesion in the production of these symptoms and our treatment so far of it. But over these internal-ear lesions experience proves we have little power. If present, and due to such constitutional states as general plethora, syphilis, gout, struma, and such organic conditions as cardiac disease, albuminuria, diabetes, we may do much by general and specific treatment to modify or ameliorate—we rarely cure. So that their presence does not affect the question of local treatment. It is rather one of diagnosis and prognosis. Nothing proves this more clearly than the study of tinnitus aurium; on which most interesting subject I wish next to say a few words.

(*To be continued.*)

## THE CAUSES AND TREATMENT OF QUINSY.

BY F. P. ATKINSON, M.D.

HAVING been in years past a frequent sufferer from quinsy I have taken special interest in determining its cause or causes and the best methods of treatment, and I believe I can, after twenty years of experience, speak with confidence as to the correctness of my present views. First of all then I would say, it is essentially a disease of debility, and is more or less associated with *adolescence* and a strumous habit. The exciting causes are sexual excesses, bodily fatigue, irregularity of meals, long-continued fasts—or, in other words, excessive nervous or muscular exhaustion. Cold and rheumatism play little or no part in its production—nervous and muscular exhaustion, as I have said, are the immediate causes of quinsy, and both these make the person also liable to take a chill and so rheumatic fever. However, I have rarely, if ever, in the whole course of my experience seen these two coexisting in the same person. Again, it cannot be the result of cold acting directly on the throat, because laryngitis would then be a much more frequent accompaniment than it now is, and a second attack rarely follows till after the lapse of some months, no matter what the amount of exposure. The *treatment* I have to advise can scarcely be termed otherwise than a specific one, since I can with perfect truth affirm that very few, if any, of the cases have gone on to suppuration which have come to me at an early period.

The effervescent citrates will be found useful in allaying not only this, but all other kinds of glandular inflammations, and I order twenty grains of bicarbonate of potassium to be taken with fifteen grains of citric acid every four hours in a state of effe-

vescence. Guaiacum, which has long been known to be beneficial in throat cases, is best given in the form of lozenges made up with black-currant jam, in accordance with the directions of the pharmacopœia of the Throat Hospital, Golden Square. One of these lozenges should be sucked frequently. Iodine, when applied locally in cases of glandular inflammation, is known either to reduce the enlargement or to hasten suppuration, according to the stage in which it exists; and a gargle, containing from twenty to twenty-five minims of the tincture to the ounce of water, will be found particularly useful. This may be used by taking a little in the mouth, and shaking the head from side to side. Port-wine is an essential part of the treatment, and it is necessary for the patient to take from four to six ounces in the course of the day, besides plenty of beef-tea and milk. By this method resolution is almost always brought about, and the patients are, with scarcely a single exception, able to resume their usual duties about the fourth day. The usual duration under the old methods of treatment was almost always from nine to ten days. I would particularly urge upon those who are willing to give the above-mentioned method of treatment a trial not to be discouraged if the patients complain of feeling no better, or even worse, for the first two days, but to persist with it all the same, and they will be certain to meet with the success they and their patients desire. Though the bowels are almost always confined it is not advisable to administer aperients, since as soon as recovery takes place they are moved as regularly as possible, without any extraneous assistance. When suppuration has commenced in the tonsils (which may be looked for about the sixth day, and made out by great throbbing in the ear on the affected side) it is best to omit the effervescing citrates and guaiacum lozenges, and depend upon the iodine gargle, together with the port-wine and beef-tea. Suppuration is by this means hastened and suffering curtailed. In conclusion, I would ask those who put this method of treatment on trial, to keep a record of their cases, and after a time make a report both of the successful and unsuccessful ones, so that we may arrive at really truthful conclusions concerning this disease.

## A SEA VOYAGE OR THE SOUTH OF FRANCE?

BY ALFRED DRYSDALE, CANNES, M.B. (LOND.), L.R.C.P.

THERE is a large class of patients who receive from their medical attendant injunctions to try the effect of one or other of the above alternatives. Most of them will come under the category of consumptives of various degrees and kinds, but other sufferers, such as dyspeptics, hypochondriacs, asthmatics, melancholics, and also persons afflicted with chronic bronchial attacks, especially if advanced in years, with laryngeal catarrh, rheumatoid or rheumatic arthritis, with chlorosis, anaemia, leucocythaemia, Addison's and Bright's disease, often receive similar advice. The objects to be gained are, of course, various, but in a very large proportion of cases it is simply to escape the inclement English winter with its accompanying moisture and cold. Other climates are moist, such as that of Madeira or Sicily; and others again, such as Canada, are cold, but the peculiar combination of moisture with cold seems only to be met with in England. In a relatively smaller class the object is to secure absolute rest or agreeable distraction as the case may be. In those cases, met with chiefly among mercantile and professional men, who are suffering from the results of brain fag, the simple quiet of a sea voyage with its inaccessibility to posts and telegrams is of itself of the utmost benefit, and often saves a patient from an impending attack of insanity. In a certain class of melancholics and hypochondriacs, on the other hand, the constant movement of a ship, to a certain extent also its discomfort and the forced companionship with perhaps uncongenial minds, is very beneficial, because it breaks up all habits of self-seclusion, common in such cases, and compels the patient, as it were involuntarily, to occasionally give his attention to other objects than himself.

My principal object in this paper is to direct the attention of English practitioners to some points with which they cannot, from the very nature of their avocations, be practically acquainted. The busier, and therefore the more efficient a medical man is, the less likely he is to be able to "Pass a winter in the south of France," or "Make a voyage to New Zealand." Considering the momentous character of the issues he will often be called upon to decide, it cannot be denied that it is of the utmost importance that he should be as well informed as possible on these heads.

To begin with, it will be necessary to dispel the illusion which possesses the minds of many even eminent consultants, that complete rest and quiet is secured by a long sea voyage. In only one sense is this true—the patient for the time being is absolutely inaccessible to external communications; he is not constantly reminded by letters and telegrams of the anxieties from which he is perhaps endeavouring to escape; and this is of the utmost importance in those cases of brain fag to which I have already alluded. In this one point it is true enough that complete repose is secured, but in every other respect the opposite is the case. On board ship it is impossible to remain long undisturbed either by day or night. If the weather is rough the pandemonium of noises is indescribable—the trampling and bellowing of the crew on deck, the creaking of the cordage, the rhythmical rattling and banging of articles of furniture thrown from side to side, and the thundering of the waves against the sides of the ship. But let us take an average day on a sailing ship with little sea or wind. Suppose the passenger to retire early, not because he is sleepy, but because there is nothing else to do. He falls asleep, but is speedily awakened by a stamping on the deck over his head which resounds like thunder. The wind has fallen, and it is necessary to put up more sail. Hence instructions have to be shouted by the captain in a loud, rasping voice; the sailors are of course unable to do their work without a chorus of some kind, perhaps of "Roll a man down," or, out of deference to the passengers, only of shouts. He falls asleep again as soon as possible, but not for long. The same performance is repeated, because this time the wind has shifted and it is necessary to "'bout ship," i.e. change the position of

the yards. The passenger, unable to sleep for long in his berth, leaves it very early—say at 5 or 6 a.m.; he gets a book and settles himself in an American chair. In vain! Men come with buckets to swab the deck; he is obliged to shift his quarters, and will not be able to return for some hours when the deck has dried. Nor can he sit anywhere else for long; some rope will be wanted which will necessitate his removal. These details are only mentioned in order to point out that a long sea voyage is not always a means of procuring absolute rest and quiet.

Also it must not be assumed that the absence of occupation is always what is required in cases of over brain-work and worry. Often, no doubt, the mere removal of the conditions which have produced the disturbance is sufficient, but in others, where the mind has become seriously unhinged by over-application to business or intellectual work, it is as essential that a new form of occupation should be substituted as that the old should be abandoned. In these cases the impossibility of procuring a variety of occupations and companionship is an insuperable objection to long sea voyages. In my humble opinion the cases most benefited by sea voyages are brain cases, but brain cases of a certain kind only. There is a certain kind of melancholic and hypochondriac who appear to be almost destitute of initiatory volitional power. If left to themselves they sit at home, perhaps, staring at the carpet most of the day, or if they go out at all they walk in a mechanical manner, seeing and hearing little or nothing. Though they may be surrounded by distractions and occupations they take part in none, and often pass whole days without speaking. Byron somewhere remarks upon the solitude of crowded cities; a person of the class just described may reside in Paris or London, but he practically comes into contact with no one. On board ship an opposite condition obtains; few persons can be conversed with, and very few distractions obtained, but such companionship and such occupation as there is cannot be avoided. The hypochondriac finds himself compelled to take cognisance of facts and persons outside his own existence; in addition, he is in a state of constant involuntary motion through the air, and this is known to produce exhilaration of the spirits. Sea voyages are certainly in the highest degree beneficial in certain forms of brain and

other nervous diseases, though even here a sharp line of demarcation must be drawn between two classes of nervous disorders, viz., those in which insomnia is a prominent feature, and those in which it is not. We must not, however, conclude that the long sea voyage must be negatived in all cases of insomnia, for the latter symptom usually depends upon one of two causes—(1) the feeble and ineffectual performance of all bodily functions, or (2) excessive susceptibility to all external stimulants, such as sounds, light, touch and position of the body, due to a morbid state of some part of the nervous system, either the sense organs, or the afferent tract, or the centres of perception. In the first class of cases sea voyages are exceedingly beneficial; the patient is constantly breathing an absolutely untainted atmosphere, and at the same time is moving through the air the whole day long without any fatigue. His appetite speedily improves, all the functions are gradually increased in vigour, and that of sleep along with the others.

It is impossible for any one to suppose that the thousand and one noises and perpetual jars and discomforts of a ship can be good for the second class of cases.

We now come to the very numerous and important class of cases to whom the presumably equivalent alternatives of a sea voyage or the south of France are so frequently offered, viz., the consumptives of various stages and kinds. These differ so infinitely among themselves, especially with regard to their duration and termination, that no hard and fast rule can be laid down; each case must be treated on its own merits. The medical man should of course attempt to arrive at some conclusion in his own mind as to the probable issue and duration of a given case before prescribing the course to be pursued, and nothing is more difficult than this in cases of phthisis. Every one of us must have seen cases in which the physical signs were slight and incipient, in which there was no marked emaciation and no symptoms specially alarming, suddenly become rapidly worse, and perish, perhaps, in three months with all the signs of acute tuberculosis, while others in whom both symptoms and signs, at the time they were first seen, have been much worse, survive for years, and even ultimately recover. To arrive at a correct prognosis with any prospect of not being confounded by

the event after one interview I believe to be impossible in this disease. The only plan I have found at all reliable is to keep the patient under observation if possible for three months, and note the difference in his condition at the end of that time. Thus a patient may be thoroughly examined sometime in the summer, and by the time October arrives, when the question of his future disposal will arise, a tolerable idea of the danger of the case may be formed. For the rest the practitioner should of course inform himself fully on the subject of sea voyages and the south of France, and administer one or the other, according to the requirements of the case.

As I have said elsewhere, my principal object in writing this paper is to dispel a few illusions still entertained even in high quarters, hoping that thereby I may save others from errors into which I have myself fallen.

To begin with let us discuss the subject of sea-sickness; its cause is obscure—even excessively obscure. Some suppose it arises from a weak or disordered digestion, but the practitioner must not be misled by this theory into confidently sending all his patients who happen to have good digestions for long sea voyages. Many persons I know who have the strongest possible digestions suffer greatly from sea-sickness, and *vice versa*: the fact is that there is no possible rule by which a medical man can ascertain beforehand whether a given patient will suffer from sea-sickness. I fancy I have observed that persons who as children have been fond of swinging, have been good sailors, and though I have tested this rule widely I have not hitherto met with an exception, but of course it cannot be relied upon. Sea-sickness appears to depend upon idiosyncrasy, and is not to be accounted for any more than are tastes.

An illusion prevails with many practitioners that persons with weak lungs are never sea-sick. The patient is assured of this by his medical attendant, and is also informed that though persons are occasionally sea-sick in steamers they never are in sailing-ships, and that even if they are a little ill the first few days, it soon passes off and never returns. The very number and conclusive character of these reasons should arouse his suspicions if he happens to have heard of the Welsh washer-

woman, who, when asked for the loan of her washing-tub, rejoined, "I haven't got one; besides, I've lent it to a friend; besides, I want it myself." I myself know from personal experience that every one of these statements is fallacious, or at least not of universal application.

Neither let the sensible practitioner or the patient cherish the time-honoured delusion that sea-sickness is beneficial. As it would be natural to suppose, interference with the prime source of the nutriment of the body and the intense prostration lasting sometimes for days and weeks together, has an irreparably deleterious effect upon the patient and sometimes determines a speedily fatal issue.

I do not wish to be understood as throwing any doubt upon the fact that phthisical patients very frequently are what is called good sailors. What I wish to insist upon is that the medical man should ascertain, if possible, beforehand whether a patient suffers from sea-sickness, and that if no information is forthcoming on this head, he should insist upon the patient taking a passage in a ship or steamer which calls at some port, say in a week after starting, so that the patient may leave if hopelessly sea-sick. I may inform the reader that it is no easy task to find a sailing-ship bound for Australia or New Zealand which calls anywhere on its way to Melbourne or Sydney, &c. The fact of calling at any port except that to which a ship is chartered biasses the insurance and renders it void. Steamers, on the other hand, may readily be found which call at numerous ports on the way to their destination.

Attention has already been called to the uncertainty of the prognosis in phthisis, and a method pointed out by which approximate accuracy may be arrived at. But supposing this has been impracticable; the patient may have appeared for your advice in October, and some decision must be arrived at immediately. In this case I am strongly of opinion that he should *not* be sent a sea voyage. The issue of his case, whatever his present condition may be, is uncertain; he would be removed from the possibility of access by his friends at a time when fatal symptoms are *liable* to supervene at any time. Nothing can be imagined more pitiable than death under such conditions: the patient is surrounded by strangers, it is absolutely impossible

to procure many things which would assuage his sufferings, and he cannot communicate with his relations.

Another point to be insisted upon is that the patient or his friends should form some clear idea as to his disposal on arrival at his destination, and should be fully informed on the climate and requirements of the country he is visiting. It is a miserable thing for a man perhaps sick unto death to arrive in a country to which he is a stranger, and of the nature of which he is completely ignorant. Very likely he arrives at Sydney under the impression that it is in the tropics, and arrays himself in gauze pyjamas; he walks about in the broiling sun, overheats himself and perspires profusely; the wind suddenly becomes icy (a peculiarity of the Sydney climate), and an attack of pleuro-pneumonia is the result.

Having indicated some drawbacks to sea voyages, concerning which I know that great ignorance prevails, I shall now enumerate their advantages.

First and foremost, the inclemency of the English winter is avoided. If the patient starts from England in October, he will arrive at Sydney in January, which corresponds in Australia to our July; he may remain in Australia till March, and then start for England, where he will arrive in June. He will then have existed twelve months without having passed through any winter at all. The same thing may be repeated next year, and thus conceivably, he might pass all the rest of his life without ever encountering another winter.

Another advantage is the uniformity of the temperature at sea. On land the various materials composing the earth's surface not merely possess different specific heats and are therefore variously raised in temperature by the same amount of sunshine, but also absorb in different degrees according to their colour, polish, &c., and their rates of radiation also vary in a corresponding manner. The result of this is that the air on land is constantly traversed by currents of air of every variety of temperature, and this is the cause of much unavoidable cold-catching. At sea there is nothing of this, and the variations in temperature are proportionally slight.

Another advantage is the constant movement without corresponding exertion, and the pure and fresh breezes.

The climate of the south of France has been so frequently described and commented upon that it cannot be supposed that the practitioner is in need of enlightenment on this score. I wish, however, to dwell upon one point in connexion with it, in which it contrasts strongly with the sea voyage viz., its easy accessibility. In case of emergency, it can be reached in thirty hours from London ; posts arrive twice a day from England, the transport occupying about two days, and the telegraph can be used at any time. All cases in which the duration and issue cannot be approximately determined, should be sent here, where in case of sudden aggravation the patient's friends can be communicated with.

To resume : it has not been my object to discuss completely which kind of cases should be sent sea voyages and which should be sent to the south of France, but to supply medical men with certain facts which, however simple and obvious, are nevertheless not well known, and the knowledge of which must have important and even vital results to many persons.

## LATERAL CURVATURE OF THE SPINE.

BY NOBLE SMITH,

*Surgeon to the All Saints' Children's Hospital.*

EVERY medical man must meet with cases of lateral curvature of the spine, and it is probably a vexed question with the majority as to the best course which can be adopted. If nothing be done the general health will suffer more or less and the deformity will be likely to increase.

The first question that will probably occur is "will the child grow out of its deformity?" Judging from the large number of *severe cases* which come before the notice of orthopaedic surgeons, it seems probable that this question is generally answered in the affirmative, and further, that the result is not quite in accordance with the prognosis.

Doubtless some slight cases do get better without treatment or rather from treatment of the general health alone, but the very large number of severe cases that exist must have a commencement, and therefore it is evident that *the majority of slight cases do not get well by themselves.*

If the reader is not aware how many very severe cases there are, I would ask him to observe closely the backs of young and middle-aged ladies in any public assembly. Let him sit on a seat in Hyde Park or Kensington Gardens and watch and make a record of backs; I think he will be very much astonished at the result, and he must further bear in mind that dressmakers are remarkably clever in hiding deformity, so that moderately severe cases will pass undetected. The evidence to be gained from such researches affords absolute proof that if a few "grow out" of curvature of the spine, the majority are not so fortunate.

The following is a case in point, sent to me by Mr. C. C. Fuller, of Albany Street.

Mr. S., aged twenty-eight, was afflicted with a very severe form of sigmoid curvature. At the age of fifteen, the spine was first noticed to be crooked, but nothing but exercises were used as a remedy, because a doctor said the deformity would *get right by itself*. Such a history is a very common one.

Then, if we arrive at the conclusion that unless some means are taken to interfere with the progress of slight cases of curvature, the possibility is that the deformity will increase; the next point which presents itself will probably be, "Is interference necessary on the score of health, or is the question simply one of appearance?" "Are we to regard the subject from a medical or an æsthetic standpoint?"

I can answer this question with some confidence, for out of about 100 consecutive cases that I have treated there have not been more than two or three in which a marked improvement in the general health has not been effected by treatment, and these few were so well in the first instance that no room for improvement in health existed.

The great majority of cases occur either in delicate children, or at least in those who are not robust. Often the symptoms of ill health are obscure, or apparently disconnected from the condition of the spine, there being no direct connexion between the two affections, except that the general weakness has probably acted as a predisposing cause of the giving way of the spinal column. But, be this as it may, the result of treatment besides lessening the deformity has been very remarkable in respect to general health. I was at one time inclined to attribute some of these results to coincidence, but their persistency in case after case soon showed conclusively that the improvement in general health was attributable to the treatment of the back.

Whatever may be the connexion between the bad health and the curvature in the early stages, the effects are usually more clear as the deformity progresses. Pressure upon the nerves on the side of the concavity are among the most frequent results. This pressure may cause so great a variety of pains in the back, or the side, or down the legs, that it is impossible to

give a description that would apply to every case. Indigestion is a common result, and it is attended by the ordinary symptoms of this malady. As the shape of the thorax changes, the space for the lungs and heart becomes reduced, and the functions of these organs are more or less seriously interfered with. Among many interesting cases of this kind I will mention one of the more remarkable.

Mr. C., aged thirty-eight, was sent to me by Mr. Azar Jones, upon the advice of Sir William Gull. He was strongly built, and of tolerably robust appearance, although looking careworn and depressed. His deformity consisted in a large protrusion in the left dorsal region, extending from the upper border of the scapula to three inches below the inferior angle of that bone. The right side of the chest projected more than the left. The deformity was first noticed after birth. He seems to have been rachitic, for his legs were curved, but were cured by the use of splints. Not much inconvenience was felt for some years from the protrusion, but subsequently indigestion, pains in the liver, and severe sciatica set in and gradually increased. About six months before I saw him he found it impossible to remain at work at an office in the city, and he spent much of his time in recumbency, as in that position he was to a great extent relieved from his sufferings. Eventually Sir William Gull was called in, and thinking that a support would perhaps do some good, sent him to see me. An instrument was applied on March 21. Slight pressure was brought to bear upon the protrusion, the opposite and upper part of the spine being at the same time upheld. The pressure was gradually increased and upon April 25 the patient described himself as deriving very much benefit from the treatment. His general health was improving rapidly, the sciatica disappeared, and his digestion was very much better. On June 7, he said that he felt like "another man," had no pain, had returned to his work, and could walk ten miles with comfort.

I referred to this case in my small work on *Curvatures of the Spine*, published in 1883, and I am able to state that the patient remains perfectly well up to the present time.

I have met with some few patients in whom pain or discomfort had not occurred until the deformity had attained to a

very severe degree and the patient had become advanced in years, but in these cases the evils, although deferred, become at last very severe, and the heart often suffers severely from direct pressure.

No one can watch the progress of curvature of the spine or see and hear the history of many severe cases without feeling very strongly upon the great importance of treatment in the early stages, at a period when we can with certainty stop the progress of the deformity, and generally remove that which has already developed.

In January, 1884, I saw Miss C., sent to me by Dr. Fan-court Barnes. Her age was thirteen and her spine showed a very slight curvature. It had been treated by the *movement cure* without any permanent advantage. I anticipated a complete cure after a few months treatment. Other matters, however, were allowed to interfere and treatment was deferred. In six months time the child was again brought to me, and so rapid had been the progress of deformity, that a very severe sigmoid curve had developed. Each curve was two inches from the median perpendicular line of the back, so that if parallel vertical lines had been drawn through the apex of each they would have been four inches apart. A cure was now out of the question, but with treatment the deformity has been steadily lessening.

The next practical point for consideration. Assuming that it is desirable to cure or stop the progress of curvature of the spine, are the means at our disposal so satisfactory that treatment is worth the trouble and expense?

If treatment necessarily involved considerable interference with the liberty of the patient, or the wearing of a heavy instrument interfering with muscular action, or any other treatment of prolonged severity, then such a question would come under consideration. But if the cure can be satisfactorily accomplished without enforced recumbency, without the application of any apparatus which will interfere with the development of the muscles, without using extension machines, and without any painful or irksome treatment, then there can be hardly any doubt that treatment should be pursued without delay in any case. The latter of these alternatives is practicable.

As to the possibility of a case getting well by itself, that

contingency is so remote that we can hardly consider it otherwise than dangerous to trust to such a result.

In dealing with a case of lateral curvature we have in the first place to decide as to its immediate cause; *i.e.* the cause which has to be counteracted. For instance, one leg may be shorter than the other; a condition which, although only acting when the patient is erect, yet undoubtedly has a decided influence upon the spine. I have met with cases in which the pelvis also on one side has been small, under which circumstances the influence acted both when the patient was sitting as well as when erect. One whole side of the body may be smaller than the other, there may be a variety of such conditions which must be distinguished from a symmetry caused by the curvature. Lameness or ankylosis of hip or knee, &c., may have the same effect as a short leg. There may be the results of former thoracic disease, such as a collapsed lung or adherent pleura influencing the shape of the spine.

The limbs may be of equal length but one may be more or less paralysed; this condition may require very careful consideration. I had such a case in a young lady aged fifteen, whose left leg was completely paralysed, including the flexors of the thigh. She was wearing an instrument to the leg, without which she could not stand, and when she walked the effort of throwing forward the whole leg had caused the lumbar part of the spine to be curved very much to the right. This was a difficult case and involved considerable modifications of the leg apparatus, the most important of which consisted in an elastic attachment from the leg to a waist belt, which took the place of the paralysed flexors. The result was very satisfactory.

Then there may be absence of one arm, necessitating a curve to compensate the balance. The curve may be *secondary* to deformity from caries in another part of the spine. There may be a congenital malformation of the spine, or we may meet with muscular contraction such as a wryneck as a cause.

Master H., aged seven, had a severe wryneck, the spine being curved as a result. On January 7th, 1884, I operated on the sterno-mastoid, and cured the torticollis. I then found that the left leg was  $\frac{2}{3}$  of an inch short, and ordered a raised boot. Eight months afterwards I saw this patient again, and the spine

and head were both straight and the child much improved in health.

A spine may be curved from using a crutch on one side only. Miss S., aged eighteen, sent to me by Mr. Parsons, of Wimbledon, had been treated for hip-joint disease, by wearing a thick sole on the foot of the sound side, and using a crutch and swinging the diseased leg. The result was curious, a long sweeping curve of the spine existed bending to the right, and consequently, as in all such cases, the right ribs projected backwards. Instead, however, of finding a corresponding projection forwards upon the opposite side of the thorax as usually occurs, this projection was present on the same side as the posterior protuberance, which clearly pointed to the deformity being caused by the crutch, which had pushed up the shoulder and flattened the chest laterally.

There may be paralysis of some of the dorsal muscles. In one severe case in a youth, Master B., sent to me by Dr. May of Reading, there is evidence of early paralysis or partial paralysis of one side which is now only very slight, although the result remains.

Then there may be deformity caused by contraction from scars, such as burns, although these cases are rare.

Posture very frequently seems to be the cause of lateral curvature, and bad postures may either depend upon disease, giving rise to pain causing the body to be repeatedly bent to one side, or to bad habits, such as standing repeatedly upon one leg, or sitting awkwardly at a desk. Such postures are often brought about by inability to sit up or stand straight from general weakness, and this cause is a very important one, because, probably, it occurs in the majority of the cases met with in general practice.

Supposing that the curvature is not caused by one of the conditions referred to above, or by some condition which I may have omitted to mention, but is the result of debility, how does the evil develop, and what is to be done for it? As to its development I have already elsewhere<sup>1</sup> said and written so

<sup>1</sup> *Surgery of Deformities*, 1880; *Curvatures of the Spine*, 1883; *Congress on School Hygiene at International Health Exhibition*, 1884; *Association of Medical Officers of Schools*, 1885.

much, that I will not weary the reader now by repeating it; suffice it to say, that I believe these cases to be produced by the spine falling into curves when the muscles cease to act from weariness, and the back is not supported, but allowed to subside upon itself. Making children "sit up" without proper back rests is, I believe, a frequent cause of this deformity.

The chief question which presents itself is, what shall we do to remedy the evil in any particular case? Of course it is comparatively easy to give better supports in the way of desks and seats, but this is not sufficient when a curvature has commenced.

Recumbency, during which the superincumbent weight is taken off the spine, has a preventive tendency, but how is this generally carried out? A child is condemned to lie in a supine position, either on a hard board, or the floor, or on a couch for a certain number of hours in each day. The enforced rest is very irksome and often interferes with healthful and natural play, and yet when that prescribed time has passed, a child may sit up for a short time and undo all the good which she has been at so much pains to produce. Then the supine position is not the best. In it the dorsal muscles get no work at all. The back is probably more or less bowed backwards, and every effort either to hold a book or almost any movement of the head or arms tends to make the back more round.

The plan I adopt is based upon a different principle; I advise the prone position on a prone couch made after the pattern of Verral, the inventor. The child is more comfortable thus than in the supine position, the back falls into a good posture, the head is held erect. Every movement tends to exercise the dorsal muscles, and to influence the back for good.

As a rule children like the prone position from the first. The beneficial result is remarkable. The chest is expanded, and where there has been any difficulty in breathing, that rapidly improves.

I believe that the great advantages of this couch over all others would have become more generally known, and would be more widely recognised than they are, if Verral's original pattern had been adhered to. I have never seen a prone couch properly constructed except those used by Mr. Chance at the

City Orthopædic Hospital, from whom I learnt their use, and those which I have had made for my own patients.

Sometimes when the back is very weak and the patient has been in the habit of bending the head forwards, the effort to hold the head erect gives rise to pain in the neck. This is simply the effect of muscular exertion and soon subsides. Occasionally one has to support the head somewhat with a pillow, but I do not approve of the band which is commonly supplied for resting the forehead on—although perhaps in some cases of caries this may be useful. Children much more readily accede to the use of the prone position than the supine because they can so much more easily play and read in such position. Another very important point as regards recumbency is that it should not be enforced for any certain length of time. So long as the child is running about and playing I think it well not to interfere, but for resting I advise that the couch should always be used instead of a chair.

The practical result is that the recumbent posture is frequently had recourse to and is not looked upon as a disagreeable necessity.

Thus by relieving the spine from superincumbent weight whenever the child is not actively employed, nature has the best chance of restoring the slight curvature.

The ordinary play of the child is sufficient exercise, without her taking walks. Walking is not a very good exercise for weak children. In many cases I believe it to be very harmful, as the movements are too monotonous and overtax the muscles of the back.

In very simple cases recumbency coupled with treatment of the general health, may effect a cure, but generally further measures are required, or at least are advantageous.

What then is to be done? Shall we advise gymnastic exercises, general or special? I would enjoin the surgeon to consider all the circumstances of the case before deciding upon this point. A great many patients are far too weak to undergo any such treatment at first. In such cases gymnastic exercises will increase the weakness by overtaxing the muscles, whereas they will improve rapidly with rest. Then again we may meet with heart disease in patients with lateral curvature, and then of course great care must be observed as regards exertion.

Exercise is a very valuable remedy in many or most cases, but it should not be used indiscriminately.

Then comes the question as to the uses of supporting apparatus; are they to be discarded altogether, or can they be employed beneficially?

I have watched the results of every kind of treatment for some years, and confidently advise that all apparatus that act simply as supports, and which interfere with the development of the muscles of the trunk, should be discarded. Heavy machines built up upon the pelvis (and in this category I include plaster of Paris and poroplastic jackets) should be eschewed. If a mechanical apparatus is needed it should be very light, and should simply *direct the movements of the body to act remedially*. This kind of action is infinitely more powerful for good than statical pressure.

Here again I will not weary the reader with details which I have already published,<sup>1</sup> but I must express the hope that all interested in the subject will look closely into this principle of construction, because I believe they will find it involves one of the most serious points as regards the treatment of these deformities.

Above all things let us remember that there is no universal remedy for curvature of the spine. Every case must be treated on its merits, and therefore I would ask you to accept with doubt the vaunted cures by any special treatment.

Failure to grasp the mechanical difficulties of treatment (which are certainly very great) underlies many of the attempts which have been made from time to time to counteract the curves in the more severe cases.

Perhaps the chief of these fallacies is that of extension of the spine.

From the earliest records of treatment of these cases we find plans described for stretching out the spine, and numberless devices have been added in the same direction at various times since.

Attempts to stretch the spine have been made to act either between the head and pelvis, or between the shoulders and pelvis, or by the weight of the body in suspension. Innumerable

<sup>1</sup> *Curvatures of the Spine*, Renshaw, 1883.

extension beds have been invented, also gibbets and stays, all acting upon this principle. I think it is not difficult to show that the principle is entirely wrong, *i.e.* that it is mechanically defective.

In the first place, as regards extension from the head, the upper cervical region is a weak point in the column, and traction sufficiently powerful to influence the curves would be much more likely to produce injury, more or less severe, to this part of the column.

But even if we could obtain firm hold of the spine at the upper part, we should yet have very little power to pull it straight,—or rather the power expended would have very slight effect. To illustrate this fact let us take a stout piece of copper wire or a thin iron rod, and bend it to represent the spine. Then hold each end with the fingers or with pincers and endeavour to straighten it by stretching it lengthways. The difficulty is great; you are working at a mechanical disadvantage, and probably you will find it impossible to pull it into a straight line; but support the two ends, and press with a finger laterally against the curve, and with much less expenditure of force the desired effect is produced. This fact as regards the wire is of course not new to you, and you would not have thought of trying to straighten it in any other way than by lateral pressure, but the argument has never to my knowledge been hitherto applied in discussing the treatment of the spine. Lateral pressure upon the apex of the curves possesses therefore an immense advantage over direct extension. It may be said that we cannot press directly on the spine because the ribs on the dorsal and the soft parts in the lumbar region interfere, but the pressure that we can apply through these structures is infinitely more powerful for good than the most carefully applied extension, and it surprises me that there could ever have existed a doubt upon the subject. Moreover, this lateral pressure can even in severe cases be applied without interfering with muscular action.

The attempt to correct the curves by propping up the arms is even less effective than extension; and the only way in which it acts is by inducing muscular power to influence the curves laterally.

Gibbetting is another form of attempted extension ; the plan was originated by Glisson, and has of late years been reintroduced by Sayre in conjunction with the plaster of Paris jacket.

Jackets made of plaster, or felt, or any other material, have been very fashionable of late years, and they have much to recommend them. They save the surgeon a great deal of trouble when once applied, the patient thinks and even feels that *something* is being done, and when, after a certain number of weeks or months, she finds that no improvement has taken place, or that the deformity has increased, there remains the consolation that the treatment has cost very little *money*. Some surgeons assert that they have effected some good with jackets ; if they have, I am sure that such cases would have derived very much more benefit from a more careful and scientific method of treatment.

A case in point is that of Miss R. In July, 1882, when I first saw this patient there was a very severe dorsal curve to the right, two inches from the middle line, and a compensating curve to the left in the lumbar region,  $1\frac{1}{2}$  inches from the middle line. A poroplastic jacket had been worn for a year, causing much discomfort from its weight, and impermeability to warmth and moisture. The back had become so weak that the patient could hardly sit up without support, and no improvement had taken place in the curves.

The jacket was discarded, and a very light apparatus which did not interfere with muscular exertion was substituted, and with careful treatment the back soon regained strength, and subsequently became perfectly straight.

I would add that because these cases are very difficult to treat, that fact is no good reason why they should be thrust aside as hopeless, or treated in a perfunctory manner.

Professional opinion often takes the following form. A very slight case of curvature is seen, and the surgeon says : "That case will get well by itself."

Another patient comes ; a case of severe deformity. The surgeon then remarks that "It is so severe that nothing can be done." But this is very illogical ; the bad case must have been a slight one once—originally it must have been in a condition when, according to that surgeon, the patient would "grow out of it."

Be assured that these cases are well worth more careful attention than they usually receive. Severe curvatures would hardly exist if in every instance of commencing deformity judicious treatment were had recourse to; and such treatment I would urge should combine the following points:—

- (1.) Freedom of exercise.
- (2.) Avoidance of fatigue.
- (3.) The prone position for rest, on a properly constructed couch.
- (4.) The avoidance of heavy instruments and jackets.
- (5.) The counteraction of the curves by pressure upon their apices.

Lateral curvature of the spine is without doubt a very difficult affection to deal with, and it is only by patient study of the varied and complicated conditions which belong to it, and by careful selection and application of the appropriate remedies, that we can hope to effect amelioration or cure of this serious deformity.

However severe the curves, and however great the patient's age, something may be done, at least, to relieve the general discomfort and actual pain which almost invariably develop sooner or later. Arrest of the progress of the affection ought also always to be accomplished, whilst in the majority of cases an improvement in position may be obtained. It is only in the earlier stages that we may be sure of removing the deformity altogether.

## Reviews.

*A Practical Treatise on Fractures and Dislocations.* By FRANK HASTINGS HAMILTON, M.D. Seventh edition. New York : 1885.

WE are not surprised that this well known, valuable, and almost exhaustive treatise has reached a seventh edition. In it the author has embodied the most recent contributions to the literature of the subject, thus enlarging the volume and increasing its practical value. It contains abundant illustrations of the various improved methods of treating fractures, in which our American brethren have been so fertile of late. In speaking of fractures from muscular action, the author says (p. 39) : " I have also quite often known the tibia to break from natural muscular action in persons of uncommon vigour." That transverse fracture of the patella is commonly due to muscular action there is no doubt, but the following statement (p. 538) is more questionable : " A patella having given way, transversely to muscular action, those fibres of the quadriceps which are inserted into the sides of the patella still continuing to act, may break the bone vertically, or cause them to separate laterally." " The source of error in estimating the value of muscular action in the production of this fracture has been, that in the majority of cases the patients have actually fallen upon their knees, and all such cases have been set down as caused by direct force ; but in a fall on the knee upon a plane surface, when the leg is flexed to a right angle with the body, the patella does not touch the plane ; it is only the tubercle of the tibia which touches, and the contact with the plane has nothing to do with the fracture, except as causing, by the concussion, a more active contraction of the muscles already rendered tense by the position and by the effort to prevent the fall."

We would submit, first, that it is scarcely possible for the fibres of the quadriceps, under any circumstances, to cause transverse fracture of the patella ; and, secondly, that the patella, being the most prominent point in the bent knee, does

impinge upon the plane when a person falls upon the knee, and is likely thus to be broken by the direct force, and that when transverse fractures occur they are almost of necessity thus produced.

Speaking of the separation of the lower epiphysis of the humerus, an accident which the reviewer has never met with, he calls attention (p. 291) to the "frequency with which examples of epiphysial separation in the case of this bone and of other bones have been followed by suppuration," especially in separations of the trochanter major, the lower end of the femur and the lower end of the tibia.

In dislocations of the shoulder the subglenoid are found to be more numerous than the subcoracoid—41 to 33—which is not in accordance with the observation of most English surgeons. The subcoracoid is spoken of as sometimes consecutive upon the subglenoid. In dislocation of the femur upon the dorsum ilii the frequent rupture of the capsule towards the lower part, the difficulty caused thereby in reduction by the old method of traction in the axis of the thigh, and the advantages of the modern manipulatory procedure are, perhaps, not sufficiently dwelt on considering their importance.

*School Hygiene and Diseases incidental to School-life.* By ROBERT FARQUHARSON, M.P., M.D., etc.; pp. 368. London : Smith, Elder. 1885.

*Overpressure in High Schools in Denmark.* By Dr. HERTEL, Municipal Medical Officer, Copenhagen. Translated from the Danish by C. G. SORENSEN; pp. 148, with charts. London : Macmillan and Co. 1885.

To treat of school hygiene in all its bearings would be to write *de omnibus rebus et quibusdam aliis.* In the course of his six chapters on school buildings, diet, work, play, and diseases, and on the duties of the school doctor, Dr. Farquharson discourses pleasantly and to the purpose of important truths as to which most parents and too many schoolmasters and mistresses are still sadly unenlightened. Without the cordial and intelligent co-operation of masters and parents, the strivings of medical men towards the attainment of a high standard of sanitation in the routine of school life must necessarily prove abortive. And the sound common-sense of this book should go far to make converts of those who have hitherto ignored some rules of health and wilfully transgressed others, because they had never been taught to realise the physiological facts on which such rules are based. Though admittedly not written for his special instruction, the medical officer of a school will find in this book several useful hints. It should strengthen the hands of schoolmasters

and schoolmistresses in their dealings with pupils and parents to the mutual benefit of all; and it should open the eyes of parents to the fact that their responsibilities are not wholly shifted to the shoulders of others when their children have been "packed off to school." There are, indeed, some points to which we may take exception; for instance, to recommend the covering of schoolroom floors with cocoa-nut matting because this will lessen dust—which on a bare floor is more obvious, and therefore more likely to secure attention and removal—is not quite in accordance with the canons of hygiene. But Dr. Farquharson's book may be said to fill a previously empty place, and, on the whole, it fills it well.

Dr. Hertel's *Essay on Overpressure* is remarkable for the conscientious care which seems to have characterised his investigations, and for the truly appalling results which these reveal. This is not lessened by the moderation of his style, or by the admittedly high figure which, as a basis for calculation, he has adopted as the standard of "normal" work, ranging as it does from six hours per diem for children of seven years of age to ten hours for those of eighteen. These hours, which considerably exceed the maxima decreed in Germany, are themselves exceeded to a yet greater extent in the schools of Denmark. Seeing that these children begin school life, many of them, in ill-health; that they usually get little or nothing between a scanty breakfast and a dinner late in the afternoon; and that little or no time is allowed for exercise, we cannot be surprised at learning that the Government commission, examining 25,228 school-children of all grades, found that the percentages of sickly were thirty-one for boys and thirty-nine for girls; while myopia amongst the boys rises from 14·7 per cent. in the youngest class to 45·5 per cent. in the sixth and oldest. Denmark seems to be learning by a terrible national experience "How not to Educate." Although education is happily not yet pressed with such "diabolic stupidity" in this country, Dr. Hertel's paper clearly shows us rocks which lie ahead. And Dr. Crichton Browne in a characteristic introduction calls timely attention to the exceptionally higher death rate, in this country, of women from consumption between the school ages of five and twenty years, as compared with males: while for the next fifteen years of life the rates between the sexes are practically equal, and above the age of thirty-five men die of phthisis in much larger proportion than women. Dr. Hertel's conclusions are eminently practical, and his endorsement of Miss Zahle's recommendation that school work should be much reduced in the case of girls between the important ages of thirteen and sixteen, will commend itself to all who realise the national importance of healthy girlhood and womanhood.

*Tracheotomy in Laryngeal Diphtheria.* By R. W. PARKER.  
Second Edition. London : H K. Lewis. 1885.

WE cannot commend the dedication of this book or the extraordinary statement in big print at the end of the preface to the first edition, which has again been printed. But we have to do with the work itself, and in many ways it is a most useful and creditable volume. We are not aware that there is another work in the English language devoted entirely to the subject of tracheotomy. Our author is fond of formulating what he calls aphorisms ; besides the extraordinary one alluded to as in the preface, the body of the book contains two pages devoted to this sort of writing. On p. 9 he attempts a definition of diphtheria—a task a combined committee of physicians and surgeons of the Royal Medical and Chirurgical Society failed to accomplish in 1876. After asserting that diphtheria is *due to a specific contagion*, he goes on to say : “The predisposition which certain individuals and families evince towards the disease is sometimes quite remarkable.” “One attack does not protect the system from a second.” In this he says it resembles measles or scarlet-fever, of either of which a second attack is an exception. “The occurrence of the exanthemata seems to favour the incidence of the poison (diphtheria) or predisposes the system to its influence ; hence their frequent association. Scalds of the pharynx and air-passages, the action of corrosive fluids, of heated air, incised wounds, the impaction of foreign bodies, and even common catarrh are determining factors of considerable importance.” They are all of them certainly at times followed by the formation of false membrane. “In hospital wards, even in which there is no known or obvious source of infection, patients suffering from low depressing disorders are, not unfrequently, attacked by this disease ; . . . . on the other hand, the disease shows little tendency to spread to other patients. The period of incubation is not accurately known. Some patients appear to become affected a few hours only after exposure to infection ; in others the disease does not manifest itself for eight days.”

May not all this point to diphtheria not being due to a specific contagion ?

With regard to the operation of tracheotomy, Mr. Parker recommends the use of chloroform. Under its administration the respiration often improves, and the operation is thereby rendered less difficult. He also recommends that the instruments for tracheotomy should be kept separate from others and ready for use. Messrs. Mayer and Meltzer make such a tracheotomy emergency-case, containing all the instruments Mr. Parker names, together with a selection of trachea-tubes.

In the details of the operation no mention is made of the bi-valve outer tube, so very useful, and by many operators

considered preferable to the tube Mr. Parker describes. He has also neglected to mention perhaps the most useful form of dilator, that which goes by the name of Troussseau's. There are objections to the three-bladed variety, but now as many dilators of this pattern are made with two blades as with three.

Mr. Parker gives reasons for objecting to the use of the sharp hook for steadyng the trachea just previous to its being opened, but another more questionable direction immediately follows. He advises that the knife should be kept in the trachea after the incision is made until a dilator has been inserted. Many risks are incurred, and injury has been done by adopting this plan. A sharp knife does not make a good director. The operator does not as a rule introduce the dilator into the trachea with the left hand, and therefore has to change the handle of his knife from his right hand into his left; while accomplishing this movement and others necessary for obtaining hold of the dilator, especially if not handed by an assistant, the posterior wall of the trachea is in imminent danger of being wounded by the point of the knife, and more than once has been so injured. A guide to the opening in the trachea can generally be secured by placing the fore-finger of the left hand over the incision directly the knife is removed.

It would be well if the remarks upon early operations were more frequently acted upon. It is shown that laryngeal diphtheria is fatal in about 90 per cent. of the cases. And in children under twelve years of age the percentage is probably higher. We are told that with "recession of the soft parts of the chest wall, especially in conjunction with more or less complete suppression of the voice . . . and if expiration should be as laboured as inspiration then there is no time to lose;" "bearing in mind" also "the comparative harmlessness of the operation as compared with the extremely fatal nature of the disease."

Taken as a whole, the work is most admirable with regard to its directions as to diet, medicine, local applications, and on the nursing and after-treatment of a case of diphtheria and tracheotomy, and shows evidence that the writer has had thorough practical experience of those departments of the subject on which he treats.

But the work is not so complete as it might be, and it will still be advantageous for house-surgeons and others called upon to perform the operation to study also and closely the admirable paper on tracheotomy by Mr. Marsh in the third volume of the *St. Bartholomew's Hospital Reports*.

## Clinic of the Month.

**Subcutaneous Injection of Blood.**—Von Ziemssen, in a recent article, makes an interesting contribution to the subject of blood-transfusion. The fact had been pretty well established that it was possible to introduce blood into the circulation through the subcutaneous tissue, and to cause in this way an increase both in the amount of haemoglobin and in the number of blood-corpuscles contained in the receiver's blood; but what effect repeated injections of small quantities of blood had on the composition and efficiency of depraved human blood was a question which had hitherto remained unanswered. He has therefore had recourse to the subcutaneous injection of small quantities (50 ccm.) of defibrinated human blood, injecting 25 ccm. into each thigh, and then estimating, by means of Vierordt's spectral apparatus, the changes which take place in the amount of haemoglobin of the blood. He found there was a distinct rise in the amount after injection, reaching a maximum in the course of the first twenty-four hours; there was then a gradual fall towards the previous amount, but never so low as the original level. After a second injection a still higher level was permanently reached, so that by repeated injections the amount of haemoglobin in the blood of the patient could be actually or even more than doubled. No bad symptoms followed the injections, neither fever nor haemoglobinuria, and even local tenderness was only present in a few cases and lasted only for a day or two. On the contrary, even after the injection of small quantities (50 ccm.), improvement soon showed itself in the form of more natural colour of the skin and mucous membranes, and in the promotion of sleep, appetite, and general bodily and mental vigour. The number of injections made was generally one or two in the course of two weeks, sometimes, however, four or five. He gives two cases—one of scurvy, and the other of marasmus in a child aged eight—in both of which the results obtained were very rapid and satisfactory. He therefore strongly recommends this method of transfusion in cases of idiopathic anaemia and chlorosis; in anaemia the result of puerperal, intestinal, or traumatic haemorrhages; and in leucocythaemia and progressive pernicious anaemia.

One of the most essential precautions, after cleanliness, to be taken in carrying out the transfusion, one whose object is the prevention of any formation of a local blood tumour, is the performance of gentle massage, drawing the fingers upwards over the skin, during the whole period of injection and for a few minutes after its completion. In this way the blood is well driven into the recesses of the subcutaneous tissue, the tendency to any local inflammation or abscess formation is avoided, and the easy and rapid absorption of the blood promoted. (*D. Arch. f. klin. Med.*, Feb. 19, 1885.)

**Intestinal Giddiness.**—The existence of this variety of giddiness has long been known to us from the occurrence of that form of it associated with, or caused by, the presence of worms in the intestinal tract. Leube has, however, for many years back noticed another form of it dependent on flatulent distension and relieved by passage of flatus, and several cases which he has recently had tend to throw some light on the subject. In these, three in number, the giddiness was associated with chronic constipation and relieved by free motion of the bowels or passage of flatus, with the sitting posture aggravated by the act of defæcation and relieved by standing or walking, and lastly with intestinal catarrh and flatulence; and in all of them he found on examination *per rectum* that the feelings of giddiness were greatly intensified either by the introduction of the finger into, or its withdrawal from, the rectum. He concludes, therefore, that giddiness in patients suffering from intestinal affections has its source in a diseased condition of the intestinal walls, the sensation being due to pressure on the haemorrhoidal plexus of the sympathetic nerve, but in what way brought about remains yet to be seen. (*D. Arch. f. klin. Med.*, Feb. 19, 1885.)

**Warm Baths and the Oxidation-process.**—As a result of a long series of observations on himself, Von Speck has arrived at conclusions concerning the influence of heat and cold on the oxidation-processes going on in the body which are strikingly at variance with the views which are generally accepted regarding these processes. He considers that the fallacy underlying most previous observations on the subject consists in this, that observers have not been sufficiently careful to eliminate the results of muscular action in their experiments, and that also their observations have for the most part been made on animals in whom under the conditions required for experiment, such as immersion in cold water, then in hot water, etc., these muscular movements may be and generally are of the most complicated and irregular character. Hence in his own observations, carried out on himself, he has been

particularly careful to exclude all fallacy arising from this source by a minimal amount of effort both while in the bath and while out, the effort in all cases being carefully regulated. He has thus been able to observe the effect of the baths on the oxidation processes of the body by accurately estimating the consumption of oxygen and the production of carbonic acid. The general view hitherto has been that within certain limits cold increases the metabolism of the body and heat diminishes it, an average temperature being thus maintained; in other words the regulation of the temperature is mainly effected by variations in the production of heat. His observations on the contrary teach that heat and cold *per se* have little or no effect on the oxidation processes going on in the body either in the way of increasing or diminishing them. He has been led by these observations to the following conclusions: (1) If the effect of muscular activity be entirely excluded, warm baths of the temperature of 37-39° C., which raise the body-warmth by about  $\frac{1}{2}$ -1° C., have just as little effect on the process of oxidation as cold baths of the temperature of 21-22° C. which lower the body-temperature by about  $1\frac{1}{2}$ ° C. (2) Changes of temperature in our surroundings give occasion to movements of various kinds; the most of these are voluntary and can be prevented by an effort of will, but the involuntary or half-involuntary movements, *e.g.* shivering and trembling, do not constantly accompany these changes nor are they peculiar to them; and although they increase to a marked extent the oxidation going on in the body, they have but little influence on the body-temperature. (3) By even the most strenuous muscular exertion, which increases markedly the oxidation of the body and hence the production of heat, we can only succeed, and that for a very short time, in raising the body-temperature by about 1° C., a striking proof how difficult it is under normal circumstances to bring about a permanent rise in the temperature and how active is our heat-regulating apparatus. (4) The regulation of the temperature can only therefore be effected through variations in the loss of heat and never through variations in the production. If these conclusions be right, they must have a valuable bearing not only on our views on fever but also on our treatment of it. It is true that the breaking up of albuminous bodies into the various nitrogenous bodies found in the urine is accompanied by the production of heat, and in fever this breaking up is greatly increased, but how far this is the cause or the effect of the fever has not yet been determined. Our present knowledge on this subject would tend to ascribe but little value to this metabolism as a source of the heat of the body. The view, that the temperature in fever owes its origin to increased oxidation, is based mainly on the assumption that muscle, even without contraction, is capable under nervous

influence of varying the amount of metabolism going on in it. His observations have led him to conclude that without muscular contraction it is impossible to increase to any great extent the oxidation of the body, and that an increased metabolism in muscles regulated by a heat-centre acting in any other way than through the motor-nerves does not in reality exist. Fever, therefore, can only be due to diminished loss of heat brought about reflexly through the sympathetic causing the arrest of the secretion of the skin and also, what is of less importance, diminishing the amount of blood passing to the skin. These results need confirmation. (*D. Arch. f. klin. Med.*, May 27, 1885.)

**Extirpation of the Spleen for Leukæmia.**—Rydygier gives an account of a patient, a woman thirty-one years of age, who had had a swelling in the region of the spleen for two and a-half years, and was now becoming emaciated by weakness and diarrhoea. An incision was made reaching from the ensiform cartilage to the symphysis pubis. There was a great deal of difficulty from bleeding, more than twenty ligatures had to be put on to arrest it. The pedicle was cut through with an elastic ligature, but notwithstanding that there was free bleeding. The patient died after twenty-four hours from haemorrhage. This makes the nineteenth case in which the operation has been performed, and in every case but one death has taken place and been due to bleeding. (*Deutsche Zeitschrift f. Chirurgie*, 5 & 6, vol. xxi.)

**Frontal Abscess in an Aged Woman.**—Schlegtentdal describes the following case. About a year previous to the operation described the patient and her friends had noticed a swelling just above the inner right canthus, and it grew to the size of about half an apple, stretching some little distance up the forehead. It fluctuated distinctly, and was painful to the touch, but there were no cerebral symptoms, so that its connexion with the skull was not thought of. It was diagnosed to be a cyst. An incision after exploratory puncture was made into the swelling and healthy pus exuded. The back wall appeared to have perforated the skull, and the brain pulsation could be distinctly seen. The wound was packed with iodoform gauze, and notwithstanding an attack of erysipelas, the patient made a good recovery in about a month, and went home with an obturator covering the opening into the skull. (*Centralbl. f. Chirurgie*. Aug, 22, 1885.)

**Plantar Hyperæsthesia.**—An aggravated and somewhat peculiar form of plantar hyperæsthesia is described by M. Barbillion. It is characterised by undue impressibility, on external stimulation, by heat, cold, pinching, pressure, &c., of both the soles of the feet, and of the soles only. It appears to be

idiopathic; when it occurs in connexion with other maladies no relationship, so far at least, can be made out. Five cases are recorded. In each of them the symptoms occurred after long walking, or in persons accustomed to much exercise on the feet. In two cases, however, a considerable interval of rest in bed preceded the attack of hyperæsthesia, which came on rather suddenly. These attacks, whose duration was practically unlimited, save by completely resting the extremities, were attended by no redness or swelling of the parts affected. In one case only a slight tendency to varices was observed. The sensations of heat and cold were easily distinguished, and cold was, of the two, more easily borne. Standing caused acute pain. One of the cases was complicated by general psoriasis, which did not exclude the soles, and by a tremor suggestive of cerebro-spinal disease, though other proofs of the latter condition were not found. This tremor however, was transient, and the psoriasis persisted after cure of the hyperæsthesia. M. Barbillon concludes that these were not ordinary cases of neuralgia, the character, continuance, and locality of the pain being different. Neither were there any signs of disease of the central nervous system, besides the tremor alluded to. The general state of the body was otherwise normal. Rheumatic dermalgia due to exposure, and affecting other regions of the body in a characteristic manner, was also here excluded. Chronic contusion of the feet due to walking, on the other hand, does not usually show the excessive tenderness, nor the symmetrical distribution of this disorder, and its etiology is more distinct. The real pathological basis, according to this observer, probably consisted either in a chronic irritation of the nerve endings in the sole, due to the mechanical pressure of excessive standing or walking, or in a change of nutrition in the skin of that region having practically the same effect. The fact that the plantar tenderness in two cases appeared during the rest which followed over-walking and not during the period of exertion is quoted in support of the latter theory. This malady proved easily amenable to energetic treatment. Blisters applied to the tender parts effected a cure in two cases. The others recovered rapidly after spraying the part with methyl chloride. M. Barbillon recommends that the spray in such cases should be freely used. Should vesication follow, the salutary effect is the more certain, and a safeguard against any further sloughing or gangrenous condition is provided by the toughness of the cuticle in this region, and by the good general health of the patient in such uncomplicated cases. (*Progrès Médical*, May 9, 1885.)

**Rupture of Suppurating Bronchial Glands.**—A somewhat uncommon cause of sudden death has recently been

the subject of a coroner's inquest, and of some very unjust charges against the medical man in attendance. A little girl, aged 12, was taken to consult Mr. G. A. Tait, who found that respiration was difficult and prolonged, and that the child was feverish. Believing that he had to do with a case of ordinary laryngitis, he gave a dose of ipecacuanha, and, when summoned almost immediately afterwards to attend the child at home, he did not do so, supposing that the mother had been alarmed by the commencement of vomiting. Unfortunately, the child was suffering from tuberculous disease of the bronchial glands; the glands had supplicated and broken down, finally opening into the trachea, and causing death in a very short time. Though a rare event, a certain number of cases of this kind are on record; in some a large piece of caseous material has become suddenly detached and impacted in the trachea, causing death in a few moments. The difficulty of diagnosis is exceedingly great, and has rarely been surmounted; the history is of great importance, but, in persons belonging to the class to which this little girl belonged, it is very difficult to obtain, and not very trustworthy. The condition is one which, both from the clinical and pathological point of view, would well repay further investigation. (*Brit. Med. Journ.*, Aug. 29, 1885.)

**Perforating Ulcer of the Hand.**—At a recent meeting of the Société de Chirurgie de Paris, M. Terrillon presented a patient, aged twenty-six, who had on both hands ulcerations surrounded with thickened epidermis resembling exactly perforating ulcer of the foot. The lesions were surrounded with an anaesthetic zone. There could be no doubt of their origin from a central nervous lesion, and the patient also had other symptoms pointing unmistakably to locomotor ataxia. M. Terrillon had also presented a similar case at a previous meeting. M. Trélat recalled an observation previously made by him, of the relation between perforating ulcer and a central nervous lesion, and stated that he has seen the ulcers upon both hands and feet in the same subject, who was ataxic. (*Rerue Médicale*, June 13, 1885.)

## Extracts from British and Foreign Journals.

**Lymphoderma perniciosa.**—Under this title Professor Kaposi of Vienna has lately described in detail a case of what he believes to be a hitherto undescribed form of skin disease. A widow, aged thirty-nine, had suffered for more than a year from an eruption, which passed at first for a universal chronic eczema. On admission to hospital the face and hands were chiefly affected, but the skin of the scalp, forehead, face, ears, and neck was of a diffuse brownish-red colour, thickened, desquamating, and with honey-like crusts here and there. In the clavicular regions, upper part of chest, and axillæ, the submammary folds were reddened more or less, and desquamating or oozing. On the abdomen and back were similar patches. The extensor aspect of the upper limbs was the seat of a certain degree of desquamation, and the skin of the wrists and hands was thickened, scaly, cracked, and oozing in places, whilst the inferior extremities were less affected. The inguinal and cervical glands were swollen to the size of nuts, and firm. No visceral disease was detected, and the temperature was normal, but violent itching accompanied the eruption. On the left thenar eminence and the flexor aspect of the fore-arms were to be felt in the subcutaneous tissue several firm nodules, in size from a pea to a pigeon's egg, fairly well circumscribed. From her admission till six months later, when the woman suddenly died after an acute paralysis of the left inferior extremity the day before, the nodosities steadily increased in number in the deep cutaneous and the subcutaneous tissue of the flexor aspect of the fore-arms, breasts, epigastrium, abdomen, face, &c. They softened and ulcerated through and became covered with crusts. The face became enormously swollen and leontiasic, and the ears stood out from the head. The spleen soon became enlarged, and a serous infiltration of the skin set in with ascites. The lymphatic glands became involved, and a progressive diminution of red blood-corpuscles was traced. At the necropsy the spleen was four times its normal size, the liver voluminous; some small nodosities were found in the lungs and beneath the pleura, and the medulla of the bones seems to have been

affected. The skin and lung tumours were all of the same character, and the former apparently originated near fat lobules. They were composed of a delicate fibrillar stroma, deprived of vessels, with connective-tissue corpuscles poor in protoplasm in places where cells, resembling lymph cells, and lymphoid nuclei occurred aggregated in extremely dense masses free in the intercellular spaces. Professor Kaposi refers shortly to cases described as *lymphadénie cutanée* by French authors, which have been described, if we remember rightly, as preceded by eczema, but he refuses to acknowledge the identity of the affections. (*Lancet*, Aug. 29, 1885.)

**The Micrococci of Osteomyelitis.**—These particular micrococci were chosen for investigation by Ribbert because they are readily recognisable in the organism. Some fluid from a pure cultivation was injected into the blood itself, and the separate organs were subjected to examination. The micrococci had already made their way all over the body into the various organs, and were seen to be ensconced in the white corpuscles of the blood. Twenty-four hours after the inoculation they began to leave the organs and emigrate to the kidney. Here masses of micrococci were found, their arrest being favoured probably by the double set of capillaries. They are also found either in the straight or convoluted tubes. It would seem that it is quite impossible to localise the probable site of a lesion after injection. The locality would seem to depend on the embolic arrest of the micrococci, perhaps determined by a local lesion. They may be arrested in the kidney whilst actually making their way out by that organ. (*Deutsche med. Woch.*, No. 42, 1885.)

**Perinephritic Abscesses.**—An interesting account is given by Fischer of these abscesses, their causes, diagnosis and treatment, as collected from contemporary medical literature. As to the causes, he places first, contusions and catching cold; after these septic poisoning and actinomycosis. (Probably it is only in South Hungary, where this latter disease is so common, that it would ever be likely to be a common cause of perinephritic abscess.) After this comes perinephritis secondary to stone or abscess in the kidney, or to inflammations of the colon, liver, lung, &c. One curious instance is mentioned where a perinephritic abscess gave rise to a ten days' obstruction of the bowels with vomiting, &c., which all ceased on the bursting of the abscess into the colon, and the patient made a good recovery. As to the natural termination of such abscesses they rarely quiet down and become re-absorbed, but usually make their way eventually to the surface, sometimes in the loin, and sometimes burst into the peritoneum causing death. Their treatment is best conducted by free incision and packing them with iodoform tampons; later

on the kidney can be removed if necessary. (*Sammlung klin. Vorträge*, 253.)

**The Bacillus of Syphilis.**—With a view to test the discoveries of Klebs and Birch Hirschfeld, Lustgarten has undertaken some experiments on the same subject. He has employed sections hardened in alcohol, which after being kept for twenty-four hours at the ordinary temperature of the room are coloured with the Ehrlich-Weigert gentian violet solution, and then placed in a watch-glass containing a one and a-half per cent. solution of permanganate of potassium. In this they remain for ten seconds, and then become covered with a brownish precipitate of peroxide of manganese. From this they are freed by immersion in an aqueous solution of sulphuric acid. Next they are washed with distilled water, and again immersed for a few seconds in peroxide of manganese and sulphuric acid alternately; they are then washed in alcohol, cleared in clove oil, and mounted in Canada balsam. By this method the bacilli were found of almost the same size and shape as the tubercle bacilli. They appear to lie most abundantly in the tissues surrounding the special cells of the syphilitic growths. They are also found in the cells of the rete Malpighii and in some of the lymph paths. They appeared to be the more numerous in proportion to the recency of the infection, and were found in great abundance in a congenital case. These bacilli can be readily distinguished from those of tubercle and leprosy by their behaviour with saltpetre or hydrochloric acid. So far no bacilli have been found in non-infecting sores. (*Wiener med. Jahrbücher*, 1885.)

MM. Alvarès and Favel have been making investigations at M. Cornil's laboratory into the alleged syphilis-bacillus investigated by Lustgarten, with the result that much doubt is thrown upon the specific nature of this organism. They aver that there exists in certain normal secretions a bacillus not hitherto described, identical in its shape and staining reactions with that described by Lustgarten as special to syphilis. It is possible that the bacillus found by that observer in sections of syphilitic lesions and in syphilitic secretions is merely this common bacillus. The microbe strongly resembles the bacillus of tuberculosis, and yields many of the staining reactions hitherto considered as special to Koch's bacillus and to that of leprosy. It is distinguished from the *Bacillus tuberculosis*, apart from its slighter thickness and its less granular appearance—conditions difficult to appreciate at a single examination—by its less resistance to alcohol after staining with fuchsia and treatment by nitric acid, and also by its not being stained by Ehrlich's method with methyl-violet.

The clinical diagnosis of tuberculosis by means of the histological examination of secretions should be made in view of these facts. (*Progrès Médical*, Aug. 22, 1885.)

**Removing Microbes from Water.**—Dr. Frankland has, we read in the *Journal of the Society of Arts*, recently made a series of experiments on the relative efficiency of filtration, agitation with solid particles, and precipitation, as a means of removing micro-organisms from water. His method was to determine the number of organisms present in a given volume of the water, before and after filtration. The filtering materials were green-sand, silver-sand, powdered glass, brickdust, coke, animal charcoal, and spongy iron. These materials were all used in the same state of division, being made to pass through a sieve of forty meshes to the inch. Columns six inches in height were used. It was found that only greensand, coke, animal charcoal, and spongy iron wholly removed the micro-organisms from the water filtered through them, and that this power was lost in every case after the filters had been in operation a month. With the exception of the animal charcoal, however, all these substances, even after being in operation for a month, continued to remove a very considerable proportion of the organisms present in the unfiltered water; and in this respect coke and spongy iron occupied the first place. Water containing micro-organisms was also agitated with various substances in the same state of division as above mentioned, and after subsidence of the suspended particles, the number of organisms remaining was determined. A gramme of substance was in general agitated with fifty cubic centimetres of water for a period of about fifteen minutes. It was found that a great reduction in the number of organisms could be produced in this way; and the complete removal of all organisms by agitation with coke is especially to be remarked. Precipitation by "Clark's process" also showed that it affords a means of greatly reducing the number of these organisms in water. Dr. Frankland concludes from his experiments, that, although the production in large quantities of sterilised potable water is a matter of great difficulty, involving the continual renewal of filtering materials, there are numerous and simple methods of treatment which secure a large reduction in the number of organisms present in water. (*Brit. Med. Journ.*, Aug. 15, 1885.)

**Iodoform in Gonorrhœa.**—Dr. A. Oger, in discussing the use of iodoform in gonorrhœa, refers to its use in solution with glycerine by M. Campana in acute and chronic conditions of the disease. The best results are attained, however, when it is applied to the diseased parts in a very fine powder. In this form Timmermans has obtained excellent results. Iodoform

being insoluble in water, he suspends, in two and a-half ounces of water, sixty grains of the drug rendered impalpable by previous solution in sulphuric ether. The mixture being well shaken, a small glass syringe is filled and injection practised. As it is important that the iodoform come in direct contact with the inflamed mucous membrane, the urethra should be thoroughly cleansed by urination immediately before the injection is made. The patient should lie on his back, and the injection be made in a direction nearly vertical, gravity thus causing the powder to seek the lower part of the syringe, and thus favouring its introduction into the urethra when pressure is made upon the piston. When the syringe has been emptied, it should be gently withdrawn, and while the meatus is compressed by one hand, with the other careful pressure is made so that every part of the passage is reached by the fluid, and the iodoform thus deposited upon the mucous membrane. After four or five minutes the fluid is permitted to escape gradually, in order to avoid the ejection of the iodoform. The operation should be repeated at least three times a day. Whatever is the stage of the disease a prompt result is certain, as is shown by diminution of pain—the iodoform evidently acting as an anaesthetic to the inflamed parts. The character of the pus is also changed, and its abundance diminished. Cure is promptly obtained; in one case resulting in five days. (*Journal de Médecine de Paris*, July 19, 1885.)

**Cold Pedal Douche for Catarrh.**—Medical science often seems to be a compound of contradictions. The hot foot-bath with or without mustard is a popular remedy for colds, whether of the head or chest. The use of the cold douche to the lower extremities for catarrhal maladies is not so well known, and by no means so frequently advocated. Recently, however, M. Bourgarel has extolled the benefit of the cold douche to the feet in diseases of the respiratory passages. As all the world knows, the object of the pedal excitant is the production of *reaction*. M. Bourgarel maintains that reaction is easily obtained by the application of cold, and for this purpose the douche need not be very forcible or long applied. It is recommended that the cold douche to the feet be systematically used. There can scarcely be a doubt of the value of this treatment provided the cases in which it is prescribed are suitable. As a general tonic to the circulatory and nervous systems, the application of cold water under some pressure to even a small area of the superficies of the body stands in a high place. The beneficial effect on the system at large reflects itself on those parts which are in a less healthy or atonic state. And so it follows that the remedy in question may put the finishing stroke to a chronic catarrh. That the temporary shock and subsequent reaction implied in

the cold douche may also prove of service in spasmody attacks is not without the bounds of physiological reason. (*Lancet*, Aug. 22, 1885.)

**Intra-parenchymatous Injections in Pneumonia.**—Boldness may certainly be necessary for success even in the treatment of disease. But what shall we say of Lépine's argument in favour of the local treatment of fibrinous pneumonia by intra-parenchymatous injections? (*L'Union Médical*, August 22.) If, says Lépine, an injection of a few cubic centimetres of a very weak aqueous solution of corrosive sublimate be made into the hepatised lung on the third or fourth day of the disease, in three or four places equidistant a few centimetres from one another, and preferably at the periphery of the lesion, with a view of preventing the extension of the disease, the following phenomena are observed: (1) At the seat of infection an immediate diminution of the crepitant râles and tubular breath sounds, which are in part replaced by respiratory silence and some larger râles; (2) sometimes, later, a transient exacerbation of the temperature of body; (3) the next day a great improvement in the general condition, and notably a precocious defervescence; and (4) a resolution which, to judge by the persistence of the "souffle," especially in the hepatised parts that have not been treated, takes place very much earlier than would have been the case under ordinary circumstances. As to the relative innocuousness of the intra-pulmonary injections in the doses employed (20 to 25 cubic centimetres of 1 in 40,000 solution of bichloride of mercury), when care is taken to keep away from the large vessels at the hilus of the lung, and not to penetrate the lung more than three to four centimetres, M. Lépine urges that he has not lost a single patient and has not had one accident. The only inconvenience is the pain, but this is not great, and may be still further relieved by adding morphia to the solution. After the introduction of the sharp needle, and before the syringe is fitted on, a few drops of blood are allowed to escape; the injection must not be delayed or the needle will become plugged. When the needle is inserted into healthy lung or into tuberculous lung it does not as a rule yield blood. In the healthy lung such injections produce sufficiently defined lesions. Experiments on the lungs of healthy dogs showed that at the site of injection of a rather stronger solution than that mentioned above there was a circumscribed and indurated area, which was made up of blood and congestive oedema. The lesions were less marked with the 1 in 40,000 solution. (*Lancet*, Sept. 5, 1885.)

**Collier's Lung**—Dr. Andrew Smart, of Edinburgh, contributes the following note on 'Anthracosis.'—"In a lecture to

the Edinburgh Health Society, delivered in November, 1883, and since published under the title of 'Germs, Dust, and Disease,' I ventured to express the view that anthracosis, or 'miners' consumption,' had but a doubtful, if any, existence. I rested that belief primarily upon the results of my own observations—not having, in hospital practice or otherwise, met with a single authentic case of it. Careful inquiry into the history of any instances of 'black spit,' which have fallen under my notice satisfied me that they were ordinary instances of hereditary phthisis, occurring—a merely accidental circumstance—in persons whose occupation was coal-mining. In any inquiry into the causation of so-called miners' consumption, it is necessary to hold distinctly in view that phthisical heredity will as certainly develop in the employment of coal-mining as in any other, even when there is nothing in the nature of the occupation predisposing to pulmonary disease. And, again, we must be careful to avoid the fallacy of supposing that coal-dust, in the expectoration, stands in any causal relation to that disease. It is now a matter of universal experience, and absolute certainty, that a great variety of industrial employments are directly and largely productive of pulmonary disease—notably, for example, among stone-cutters, steel-grinders, iron-miners, etc. In my lecture referred to, I adduced, in support of the view of the non-existence of anthracosic disease, statistical evidence from Dr. Ludwig Hirt's researches into the effects of different kinds of dust upon the health of workers employed in dusty occupations. These tables are elaborately compiled from the records of hospitals, in which patients in large numbers had been treated for trades' maladies. Dr. Hirt's results are summarised under the headings of 'effects of metallic dust,' 'mineral dust,' 'animal dust,' 'dust from poisonous metals,' and 'vegetable dust.' Taking pulmonary consumption as a test-disease whereby to estimate the comparatively hurtful effects of the inhaled dust, he shows that there is a mortality from consumption in the first group amounting to sixty-nine in every 100 sick needle-makers, the mortality diminishing to ten per cent. in the brass-workers. The grind-stone-makers, in the second group, have a death-rate of ninety per cent., which falls to nine per cent. in the diamond-workers. The maximum pulmonary mortality in the third group is forty-nine per cent.; in the fourth, thirty-six per cent.; and, in the fifth class, it varies from sixty per cent. among the cotton, flax, and hemp dressers, to that of the coal-miner, which is represented as only a fraction of one in the 100 sick. That is, while the lowest consumptive death-rate, in all the other dusty occupations, is little under ten per cent., there is but a single consumptive death occurring in 125 coal-miners treated in hospital. This fact is, I need not point out, contrary to generally

received opinion; and if correct (and it cannot reasonably be questioned) it shows that coal-mining is not only the healthiest of industrial employments, but one, moreover, which is absolutely unproductive of pulmonary phthisis. In fact, it puts the coal-miner on a par with the most healthy of the rural population, with a death-rate from phthisis below that of the general population. Dr. E. Headlam Greenhow, in his very able 'Papers Relating to the Sanitary State of the People of England,' although carefully avoiding any such conclusion, cannot, however, escape the conviction which the results of his elaborate inquiries force upon him. With his statement that lead, copper, and tin-mining are 'dangerous to health,' he affirms that 'coal-mining is not unhealthy.' And, again, 'the occupation of coal-mining does not increase the death-rate of the class.' He finds, however, that in districts in which coal and iron-mining are combined, the pulmonary death-rate is higher than in purely coal-mining districts; a statement which, in fact, refers the pulmonary mortality, and its producing cause, to the effects of the iron-dust respired during the process of iron-mining. Since my lecture was published, I have personally examined a large additional number of coal-miners from different districts, and in other ways extended my observations, with results entirely confirmatory of the exceptionally rare occurrence of pulmonary consumption among the coal-mining class. Looking to their longevity, high standard of health, and low death-rate, especially from pulmonary disease, one is led to suppose that there must be some special protective feature in coal-mining operations not shared in by the rest of the dusty trades. The preserving element may, after all, be the dust derived from the coal, which has hitherto been credited with the opposite effect. The antiseptic properties of carbon are generally admitted; and I can aver that, not unfrequently, I have examined miners who, for over fifty years, have daily respiration the coal-dust-laden air of the mines, with no other effects than the perfectly harmless staining of the sputa, and, it may be, in some instances, of the pulmonary tissue." (*Brit. Med. Journ.* Sept. 5, 1885.)

## Notes and Queries.

HODGE'S NEW TRUSS.—There are two points of interest and we think, of value, about this truss. First the pad is a mushroom-shaped piece of solid soft india-rubber perforated with holes for ventilation. The equable and elastic pressure of this pad makes it extremely comfortable to wear, and we should imagine it free from the risk of widening the hernial aperture to which some pads are liable, and the more conical the more liable. Secondly, the pad is fastened to the encircling spring by an admirable sector-joint, which can be set and securely fixed at any desired angle. Another set-screw regulates the curvature of the encircling or hip spring. Altogether the instrument once properly adjusted would seem to afford a support more like that of a skilled and intelligent hand than most other trusses that we are acquainted with. Hodge and Co.'s address is 18, James Street, Oxford Street, London.

BARFF'S KREOCHYLE.—This is a limpid and palatable solution of meat, differing from most meat-extracts so-called in being richly albuminous, without burnt flavour, and with but little of the degraded waste products that make beef-tea a stimulant rather than a food. We have seen it relished and well-retained in cases of capricious appetite with nausea, and regard it as a useful alternative in those perplexing cases where one artificial nutriment after another palls or is rejected.

BENSDORP'S ROYAL DUTCH COCOA.—Among the many excellent preparations of so-called soluble cocoa which have in recent years been placed at the disposal of the practitioner, this form has some merits of its own, which may make some of our readers glad to hear of it. It is very miscible with hot water, has a very fine and strong aroma, and has nothing starchy or fatty about it to make it objectionable to weakly or fastidious stomachs. Indeed, some of our patients consider it a dietetic luxury which they would not willingly dispense with, while the price is such as not to forbid it even for hospital use.

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\* \* \* Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C.; WILLIAMS and NORRAGE, of Henrietta Street, Covent Garden, W.C.; or BAILLIÈRE, of King William Street, Charing Cross.

## Department of Public Health.

### ABSTRACT OF A REPORT ON A LOCALISED RECURRENCE OF DIPHTHERIA.

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TIPTREE HEATH, an Essex parish of 1,000 persons, extends in straggling fashion, with south-eastern aspect, along some three miles of a ridge of relatively high ground. Agriculture, here specially developed in seed and fruit-growing direction, forms the universal employment. Sanitary arrangements are those commonly found in scattered rural districts: each cottage has its garden, each its closet of the old-fashioned type; pumps and dipping-wells abound, for water is perhaps only too easily obtainable in the patches of drift which cap the London clay.

During the past eight years Tiptree has been the scene of a remarkable series of diphtheria outbreaks which, notwithstanding the general uniformity of environment of the cottages throughout the Heath, has been singularly unequal in its incidence on the different groups of dwellings into which Tiptree may be divided.

More than half the families known to have been attacked during this period reside within an area which, in extent and population, does not exceed one-eighth of Tiptree Heath. This *special area*, which for brevity we will call "A," has, therefore, suffered in more than sevenfold proportion. It forms the south-east corner of Tiptree, and contains the Congregational chapel and school, with some twenty-five to thirty dwellings almost

exclusively tenanted by families who habitually attend that chapel. In previous years fatal outbreaks of diphtheria had not been rare in the vicinity of Tiptree, but not until 1877 can I find that any epidemic had visited the limited area, which, since then, has been so severely afflicted.

In the autumn of that year diphtheria was imported from Coggeshall—where a severe epidemic had occurred—to a better-class house in A. The infection spread to the groom's family, and from the groom's to at least three other households connected in various ways with each other, and all of them attendants at the chapel before mentioned. Four deaths are recorded.

In 1879 the minister of that chapel lost a child from "tonsillitis." After events, however, convinced the medical attendant that this had in reality been diphtheria.

Nothing more is heard till the autumn of 1881, when a sharp outburst suddenly occurred and as quickly subsided. Of twelve families known to have been attacked, in ten the first sufferer was a child attending the chapel school, and of seventeen children of that school who were severely ill, no less than thirteen were in one particular class. In March, 1882, a good-class house just outside the limits of A, became infected through a servant. Ulcerated throats had been prevalent, and a neighbour had shortly before suffered from one. From June to September four other families, more or less connected with each other, were invaded, and in October the Congregational minister again lost a child. He had been sitting with a family named Moss, which had been very severely attacked, and, it was supposed, had unwittingly conveyed the infection to his own home.

This diphtheria of 1881-2 cost ten lives.

In the winter of 1883-4, an isolated outbreak occurred in a family intimately connected with the Mosses, who had suffered more than a year before. No other explanation of this recrudescence was forthcoming. Beyond a death from croup in 1884 nothing was heard of diphtheria till May, 1885, when another explosion, though on a smaller scale than in 1881, once more drew attention to Tiptree Heath.

For the third time the Congregational minister lost a child, and almost simultaneously several other houses in the vicinity of the chapel were attacked. Of nine families, the first case in

eight was a child who had attended chapel Sunday school within incubation period; in six (possibly in seven) the child first attacked had also attended chapel week-day school. There were four deaths. The schools were closed, and the outbreak came to a sudden end.

This very imperfect sketch presents to our view a series of small, very localised, outbreaks of diphtheria, extending over eight years, and linked by sporadic cases or smouldering occurrences, at considerable intervals of time. If our knowledge of the natural history of diphtheria were fuller than it is we might possibly link these outbreaks in regard to causation as well as in regard to time. For my own part I am inclined to regard the diphtheria of 1885 as the lineal outcome of the diphtheria of 1881, if not of the Coggeshall stock imported in 1877, for the following reasons:—

1. The disease has clung throughout to a special locality, which for many years previously had been free from it, and, as we shall presently see, has specially affected the particular community into which it was imported in 1877.
2. From 1881 to the beginning of 1884 some connecting link can be generally traced from family to family.
3. With the doubtful exception of a young woman, who had a bad throat two or three days after coming from London in 1881, no fresh importation has been traced since 1877.

Be this as it may, we are now in a better position to analyse that incidence on a limited area of Tiptree which was demonstrated in the earlier part of this report.

Besides its distribution in point of space, every community can be divided into certain well-defined groups, such, for example, as the physiological groupings of sex or of age, and the social groupings of employment, of status, or of religious belief.

Without burdening the reader with details I may state that the result of a careful inquiry into the circumstances of the thirty-five families who are known to have suffered from diphtheria during the past eight years at Tiptree, was this:—There are two principal religious sects at Tiptree—"church" and "chapel"—estimated as being nearly equal in point of numbers. But the gross incidence of eight years has been six times greater on chapel-goers than on church-goers.

There are, moreover, two schools<sup>1</sup>—the national, or church, and the British, or chapel—also fairly equal in numbers. But, taking the whole eight years, families sending children to the chapel schools were infected nine times more than families sending their children to the church schools only. Of thirty-five first cases in families, thirty were of children in one way or other connected with some school, and, of the thirty, at least twenty-seven had attended the chapel schools within incubation period.

The problem of relationship between the incidence on a special locality and the incidence on a special community (the chapel people) seems, therefore, to be narrowed to this—that an essential factor must have been some condition of attendance at the chapel schools. There is, however, a preliminary objection to be considered.

It will be remembered that the special locality "A," contained *inter alia* the chapel schools. Now, a fairly approximate estimate shows that children residing in A and attending those schools suffered in about a threefold proportion to their school-fellows living elsewhere. Might not this indicate some cause associated with A *generally*, to which children therein resident would be naturally more continuously exposed than the others who would only be subject to its influence during such time as they were at school, or as they passed to and from school?

But, if so, how are we to account for the almost total escape of adults and children residing in A who did not go to this school? It is true that children of school ages are disposed to take diphtheria in greater degree than their elders and youngers, but the difference is insufficient to explain the present facts.

Why then this excess of attacks on children from A? An explanation may be sought in two directions. *Firstly*: residence in A might *predispose* to diphtheria.

The greater part of A is certainly flatter, more shut in by trees, and consequently has an atmosphere rather more humid and less free than the rest of Tiptree. It contains, also, the chapel burial ground, in which, during the past thirty years, many dead of diphtheria have been interred. It has, moreover,

<sup>1</sup> Each has its Sunday school attended by very nearly the same children who come on week-days.

acquired perhaps more than any other part of Tiptree an unfavourable repute for pig-keeping.

There is in the medical literature of diphtheria a good deal of observation of a general kind as to the connexion of that disease with some of these conditions, more especially with damp; but even in this regard the evidence is by no means conclusive, nor if it were so is the physical condition of A so distinctive as to justify us in ascribing to it alone the incidence on the A children.

*Secondly:* children from A may have been, and in my opinion were, *more exposed* to any current infection at the school.

They would probably, for example, be the more constant attendants, and so would be the more subject to any local cause attaching to the school premises, or to infection brought to the school.

I believe, therefore, that the issue is fairly narrowed down to the conditions of school-attendance.

At Tiptree chapel schools there were sanitary defects of a serious kind. Down to 1881 a row of common privies had stood against the schoolroom wall immediately under its windows, and the air of the room had been tainted by them. After the outburst of diphtheria in that year, two of these closets were removed, and the remaining two converted into pail-closets. Still they were small and dirty, and the schoolroom wall opposite the boys' closet remained damp from the soakage of urine for forty years down to the present.

Until 1877 the school children had drunk water from a well dangerously near these privies. This had been closed at that date, and down to the outbreak of 1885 water was brought to the school from a well at the minister's house.

Eighteen yards east of the well last named four graves are pointed out of a family who fell victims to diphtheria some twenty-five years ago; not much further to the north are other and recent diphtheria graves, all in a porous sand, in which water is found not many feet from the surface. Still nearer to the well were defects of drainage directly threatening pollution by soakage of slops and of the wash-water of infected clothing.

It must be admitted that a popular feeling, that in these insanitary conditions lay the root of the evil, was based on very reasonable grounds.

But, passing over the fact as regards the well, that there were particular cases of children who had not drunk the water, and passing over the objection that, neither in regard to water-supply nor to what are known as "filth-nuisances," has any relationship of epidemic diphtheria yet been determined by good inductive evidence, there is a difficulty which, unless it is to be set aside as a mere chance coincidence, appears to me to be fatal to the popular conclusion. All the children of the week-day school had access to the water, and those who were attacked were certainly not more exposed to the evil effluvia of privies, &c., than their fellows. Nevertheless, the incidence on different sections of these children has been singularly unequal.

During the last five years some forty of them (Standards I. and II.), aged about six to nine years, have relatively to their numbers suffered five times more than the whole remainder of the school—about sixty in all, thirty aged three to six and thirty aged nine to twelve.

The physiological proclivity of age will not explain this, according to observations which I had elsewhere made to determine the point.<sup>1</sup> Of 157 children I had found that

Of 55 aged 3-6 43 per cent. were attacked.

" 44 " 6-9 34 " "

" 58 " 9-12 31 " "

In the explosions of 1881 and 1885, which more especially affected the chapel school, the incidences on the various standards were :—

Standard.	Percentage attacked.		Standard.	Percentage attacked.	
	1881.	1885.		1881.	1885.
Infants . . . . .	3·	3·	Standard III. . . .	8·	nil
Standard I. . . . .	56·	9·	Standard IV. . . .	nil	nil
Standard II. . . . .	12·	25·	Standard V. . . . .	nil	nil

The three younger classes occupied the lower end of the common schoolroom. Behind them were arranged numerous hooks

<sup>1</sup> See *Practitioner*, xxxi. and xxxii., for an account of the method adopted and of the normal age-predisposition to diphtheria.

for the girls' clothing. The boys' hooks, not more than half as many as the girls, were at the upper end. The younger children would therefore be somewhat more exposed to risk from any infected clothes brought to school. But this was the only distinction that a critical examination could elicit.

I must confess a certain disappointment at this result. I had hoped to establish a definite connexion between the outbreaks at this school and some local condition of the premises.

There is an alternative point of view; if the infection was not stored or generated on the premises it must have been brought there.

I was much struck by the resemblance of the "explosive" outbreaks of 1881 and 1885 to those which I have recorded in the *Practitioner*, vol. xxxii. p. 67, and no other explanation seems to so well accord with the facts as that theory of a special development of infectiousness of an individual case which was then suggested.

Cases of throat illness in the section of the school which was so severely attacked had preceded the explosion of 1881, and the first case which I could trace in 1885 was a girl (in Standard II.) who had been ill three weeks with a bad throat, which had pulled her down and left her anaemic. There is no direct evidence of membrane in the throat, nor of paralytic sequelæ, but in the words of the mother, who by no means admitted that her daughter had had diphtheria, "*as soon as the girl returned to school the children all began to go down with it.*"

It is true that in limited outbreaks of this kind statistical conclusions have to be drawn from scanty data and must be expressed and received with great reserve, but when we find that a series of such outbreaks resemble each other in their rapidity of rise and subsidence, and in their special incidence on particular groups, the probability that this is not a mere matter of chance, but the result of a general law, becomes proportionately strengthened. And when we observe that a common antecedent of these explosions is the intimate association, with the groups specially attacked, of some previous case of diphtheria or of throat-illness, the inference that the outbreak is a consequence of such cases becomes more and more sure. Accordingly I

regard the Tiptree experience as corroborative of the views to which I have referred.

It will still be asked, Why should the chapel schools suffer more than the church ?

Of course the suggestion is very possible that the poison was, after all, somehow stored up at the chapel schools, and that occasionally it became intensified in the person of some child or other who formed the focus of the respective explosions.

But a closer analysis shows that the excessive incidence on the chapel-folk, which we have hitherto considered only in the gross, was almost entirely the result of those explosions. Removing for the moment from consideration the original outbreak of 1877 and the epidemics of 1881 and 1885, it is found that the sporadic cases and more lingering prevalences which linked those outbursts affected the chapel community little more than the church.

The case seems thus to be reduced merely to this : a particular school, into which diphtheria had been previously imported, suffers from two explosive outbreaks, while a neighbouring school has none. If the theory is true, that an essential factor of such outbreaks is an individual case in which an intensification of infectiousness is somehow induced, it follows that the event of two outbreaks happening in the same school in succession may be simply an affair of chance, which it would be vain to seek to explain further than by presuming that there would always be a greater probability of recurrence in a community in which diphtheria had previously spread than in one in which it had not.

## THE NEED FOR UNITY IN LONDON GOVERNMENT.

In the first annual report which Dr. Edward Seaton has presented to the vestry of Chelsea, the need for unity in London government is dealt with from certain points of view which concern the health officer. This portion of the report runs as follows :

I propose to devote the third section of this report to a brief consideration of subjects, which have been under notice during the past year, but which it is impossible for me to discuss without reference to the larger subject of London government. I must at the same time premise that I am not about to attempt to treat exhaustively the very wide question of municipal government generally, or even so much of it as may be said to directly concern the public health. To do so would be far beyond the scope of the present report, which deals only with such matters as have been before the vestry during the past year. I shall therefore limit myself now merely to the consideration of those parts of sanitary administration by which it is intended to directly prevent the spread of infectious diseases.

We have long passed the time when epidemics were regarded as mysterious visitations, whose appearances were connected with the position of the heavenly bodies, and which were subjects for the study of wizards and astrologers. We have also partly emerged from that period of very imperfect knowledge, when the occurrence of infectious diseases was vaguely ascribed to accumulations of filth and foul smells in the neighbourhood of dwellings, when the dangers of microscopic organisms were not recognised, and the specific nature of diseases ill understood. The study of etiology—that is to say, the natural history of diseases, including their mode of origin and ways of spreading—has revolutionised opinion, and entirely altered the practical methods of dealing with epidemics.

We now know that the spotted typhus—the gaol or famine fever, as it used to be called—is a deadly disease, which may be said to be capable of existence only where overcrowding, dirt, and destitution are to be found ; that to eradicate this pest we must remove the sick to airy and well-ventilated hospital wards ; that we must pull down houses and open up the crowded courts in the locality where it has made its nest ; that we must destroy foul bedding and clothing, replace it with new ; ventilate, cleanse, and whitewash the rooms from cellar to garret ; that we must also, as a preventive measure, administer nourishment to those who need it. We know that in typhoid or enteric fever we have an enemy of an entirely different kind to cope with, one that is as likely to find its home in the mansions of the rich, as in the hovels of the poor ; that in this disease ordinary cleanliness will go but a little way towards securing immunity from its attack ; that its germs are to be found in the bowel discharges of the sick, which may contaminate our drinking water, or the milk which comes to us from the country ; that the accidental specific contamination of a water supply in this way, even in so slight a degree as to defy the skill of the analytical chemist, may (as happened at Caterham<sup>1</sup>) give rise to hundreds of cases ; or that the bad sanitary arrangements of a farm in Oxfordshire may cause an epidemic such as that which occurred a few years ago in Marylebone.<sup>2</sup> We know also that in small-pox and scarlet fever we have diseases which are still less amenable to measures of ordinary cleanliness. For some unexplained reason, the former is even more fatal now to unprotected persons, than it was in the days when people lived over cesspools, habitually breathing foul air, and drinking polluted water ; and if the course of an epidemic be closely watched in towns partly consisting of very old, and partly of quite newly constructed houses—but populated throughout by a class of persons equally neglectful of vaccination and re-vaccination—it will be found to

<sup>1</sup> Report by Dr. Thorne Thorne on an Extensive Epidemic of Enteric Fever at Redhill, Caterham, &c.—Annual Report of the Medical Officer of the Local Government Board for the Year 1879 [c.—2681—1.]

<sup>2</sup> Report by Mr. J. Netten Radcliffe and Mr. W. H. Power on an Outbreak of Enteric Fever in Marylebone, &c.—Report of the Medical Officer of the Privy Council and Local Government Board. New Series, No. II. 1874 [c.—1066.]

prevail indiscriminately in foul and dirty slums, and in districts, which as regards their dwellings, may be compared to those of a modern Hygeia. Vaccination is the great prophylactic which has converted this terrible scourge into a comparatively harmless disease. But in order to prevent small-pox altogether, vaccination must be *efficiently* performed in infancy, and repeated at least once in early youth. The first of these conditions is, however, not always fulfilled; and the precautionary measure of re-vaccination is unhappily generally neglected, except at times of panic, and not even then resorted to by the wage-earning classes without pressure. Experience having taught that we cannot wholly rely upon vaccination for the prevention of small-pox epidemics, we are obliged to consider the practicability of other measures. In complete isolation of the sick, accompanied by disinfection, we have a second resource, which has proved very useful, not only with small-pox and typhus, but also with scarlet fever.

The diseases referred to are among those which are frequently spoken of as preventible. They are rightly so termed, provided always that efficient machinery exists for their prevention. The first and most essential part of that machinery is a properly constituted sanitary authority, armed with necessary powers and furnished with adequate appliances. This will be made more clear by illustration. Small-pox is termed a contagious disease; that is to say, once started in a locality and left alone, it will spread rapidly from one susceptible person to another, and will go on spreading amongst those who, in the pursuit of their daily avocations or by social intercourse, are brought in contact with the infection. The natural laws regulating the development of an epidemic are as intelligible as those which allow a fire, commencing as a small flame, to end in a general conflagration. If London were partly built of timber dwellings, and a fire were once fairly started, the flames would not respect the artificial boundaries of parishes, which may intersect streets and even houses. It would only be the interposition of non-inflammable structures, or the natural boundaries—the river, the parks, open spaces, and wide roads—which would place a limit on the ravages of the devouring element. But in order to make good the comparison

between the spread of fire and epidemic diseases, it must be remembered that in the latter case there are many ways in daily life by which the seeds of a contagious disease may be dispersed (to form fresh foci of infection) in any community, whether it be that of a little village or the vast city of London. So that, if we desire to draw a closer analogy, we must imagine a conflagration, extending to buildings all around, and from its centre burning brands constantly being carried to distant parts of the town, there to kindle new fires and to set the neighbourhood in flames.

These remarks serve to introduce the observations I have to make on the need for unity in London government, as the first step towards furnishing the requisite machinery for preventing and controlling epidemics. I speak of preventive measures as "machinery," because I wish to continue the parallel between the public service for fire extinction and that for stopping the spread of infection. The machinery for putting out fires is simple and effective. There is the central organising department: there are the fire stations; there are the engines of modern construction in constant readiness for use; there is plenty of water on the spot to be had the moment it is required. Finally, to complete the chain, there is a system of notification by recognised signals, so that the proper authorities are made acquainted with the existence of the fire almost directly it is discovered. Each portion of the machinery is essential; if any part be deficient the whole is inoperative. Without a central organisation there would be nothing but mistakes and confusion. The fire engines would be useless if there were not horses at hand, almost ready harnessed, and men prepared to drop into their places. Without water in abundance the pumping apparatus is of no avail. Lastly, the system of notification, however perfect, would be fruitless in any part of the service system were out of gear—if there were no sufficient water supply, if the engines could not be conveyed to the spot, or if the men did not know how to use them. Equally so in the case of infectious diseases. "Notification" is a mere idle form unless it be regarded as an essential part of the whole machinery or service for stopping the spread of infection. Another essential part of the same service is the

central organisation, which should prevent confusion and secure the adoption of the necessary measures throughout the community. But London has *thirty-nine* separate sanitary authorities, each acting independently; and while many of them exercise their functions indifferently, some are content to neglect them altogether! What good then could be expected of systematic notification in a city whose local government is so disorganised?

The comparison between the municipal arrangements for arresting the spread of infectious diseases, and the service for fire extinction, is not ideal. American cities furnish examples of the practical working of this branch of sanitary administration, which is as perfect in its details as the system by which the spread of fire is kept under control. But it is not necessary to go to the New World for illustrations. Some of our best governed provincial towns have for several years pursued a policy of prevention, which has led to very satisfactory results. In order to give point to my subsequent remarks, I will refer specifically to the sanitary arrangements in the town of Leicester as an instance of what may be achieved in this direction. In that borough, it is well known that vaccination has been neglected to a very dangerous extent, and yet the authorities have been able to keep the district free from small-pox for a long time, by means of early notification, followed by immediate isolation and disinfection. In the following brief sketch I am describing arrangements which have been adopted there or in other provincial towns with whose methods of administration I have become practically acquainted.

The corporation or town council delegates its principal functions as sanitary authority to a "health committee," which has charge of all the arrangements for preventing epidemics. The medical officer of health is the responsible adviser of this committee, and being also its chief executive officer in work which is distinctly medical, he is placed in a position of great trust. He is armed with sufficient powers. All householders are required, under penalty, to notify to him the existence of dangerous, infectious diseases, to wit—cholera, typhus fever, small-pox, enteric fever, diphtheria, and scarlet fever, it being recognised that their concealment may be a risk to the whole

community. The medical gentlemen who are in professional attendance on such cases, are required for a fee to furnish certificates of the nature of the disease on printed forms, with which they are kept supplied. Information from these sources is usually reliable and complete, but it may be supplemented by that which comes from relieving officers, school-board inspectors, clergy, district visitors, and others. From wherever it comes it converges in one centre—the office of the health department. This office is in a convenient situation, and open to the public at all hours. It is under the control of the medical officer, who visits it frequently, and when absent is represented by the chief inspector or clerk, who is well acquainted with his movements. From the office messages may be sent to the ambulance stations, or to the "isolation" hospital. Of the "epidemic" or "isolation" hospital, it is needless to say more than that its situation is sequestered, away from the vicinity of dwellings, but at the same time not too remote from the population it is intended to serve; its appearance is attractive, and its administration free from all taint of pauper associations. Here also, as at the office of the health department, everything is under the control of the medical officer who is responsible for keeping the town free from epidemic disease. It is understood that the hospital exists for this purpose. It must be ready for use at any moment, though it may be empty for months together. The expense of maintaining it, with its nursing staff constantly in efficient working order, is considerable, but the enlightened ratepayers regard the outlay for this purpose as they do that for keeping up the fire brigade. Close to the hospital buildings are one or two empty but furnished houses, into which persons who have been exposed to the infection of small-pox or typhus fever can be received for that period (about a fortnight), in which the disease may be incubating, or in course of development, during which it is desirable they should be under medical supervision. The committee, representing a corporation powerful in its resources, is not only able to enforce the seclusion of individuals for the public good, but is also ready to board them, pay their wages, and even to afford them reasonable compensation for any loss of business they may sustain. Furthermore, the arrangements for immediately isolating the sick, and watching those

who may become centres of infection, is supplemented by ample provision for disinfection of houses, bedding, clothing, and furniture, which is scientifically and rigidly applied. The actual result of these carefully-planned and well-executed measures of precaution is *freedom from disease*. A remarkable instance of the success of this policy is afforded by the town of Leicester, whose inhabitants, by a most foolish neglect of vaccination, have laid their city open to especial danger from invasions of small-pox. It is for this reason unquestionably triumphant proof of the value of compulsory notification—with its concomitants, isolation and disinfection—that notwithstanding several invasions, the health committee has been able to keep the borough free from epidemics of this most highly contagious disease.<sup>1</sup> And, whether the authorities continue to be successful or not, the experience at Leicester will always be pointed to as furnishing strong evidence of the efficacy of such measures.

In striking contrast to such a masterly system of dealing with contagious disease is the aimless method of procedure which may be studied in this great metropolis. Here there are thirty-nine nominal sanitary authorities, and yet there is not one such authority which could possibly undertake the work of preventing epidemics. It must be admitted that the vestries never recognised their responsibilities from the very first. In default, the Asylums Board, a body composed of representatives of the guardians of the poor, became the hospital authority for London. Born under the blighting influence of pauper associations, from which it appears even now quite unable to shake itself free, this Board was by its very constitution an unsuitable representative of the sanitary authorities of London, in respect of that function in which conjoint action was essentially necessary. The traditions of its birth may have prevented its managers acquiring any clear conception of the purpose it might be expected to fulfil. Be that as it may, they appear to have always

<sup>1</sup> It is noteworthy in this connexion that the statistics as to small-pox mortality in Leicester, as published by the Registrar General, do not correspond with the actual facts. For many years past those returns have exhibited an absence of small-pox deaths in the borough. But this is due to the circumstance that the Leicester small-pox hospital, to which all cases are removed, lies outside the borough; and the deaths are hence recorded as having occurred in an adjoining rural registration district.—ED.

regarded the *treatment* of the infectious sick as their prime object, and to have completely lost sight of, if indeed they ever entertained, the idea of *preventing* epidemics ; otherwise it would be difficult to account for the curious complacency with which reference is made to the abundance of their resources in providing for increased numbers of the infectious sick. The real test of the efficiency of the Board is not its capacity for receiving and treating in a most generous manner hosts of persons stricken with contagious diseases, but rather the disappearance of those diseases in the form of epidemics. These, however, have flourished, whilst the isolation hospitals have multiplied in number. In fact, the ratepayers of London have spent millions of money, and small-pox, the disease which should have been limited, if not prevented, has, during the last few years, been worse than ever in its ravages !<sup>1</sup>

If I have succeeded in making myself clear it will be seen that the very first step towards providing efficient means for the control of epidemics is by the creation of a real sanitary authority for London, in other words by obtaining [for the capital a municipal government similar to that enjoyed by the great provincial towns of England. Referring again to the subject of "compulsory notification," this measure is only useful as a means to an end, and its principal use in contagious disease is as the first step towards isolation. But at present the sanitary and hospital authorities of the metropolis are separate bodies. To whom, then, should the notification be made ? The Asylums Board removes to its hospitals all who desire admission, but there remain at home a sufficient number to keep up the spread of infection, and consequently little good results from this action. The policy of shifting the cases from one populous part of London where disease prevails to another

<sup>1</sup> The excessive prevalence of small-pox in London, which I believe to be entirely due to a want of proper government, costs the inhabitants much suffering, and heavy loss both of life and money ; for, independently of the expense entailed in maintaining the sick, it must be remembered that, while children are largely protected by vaccination, it is the adults—the bread winners—who fall victims to small-pox. These evils are terrible ; but the mischief does not stop here. The mismanagement of epidemics in the metropolis is a standing menace to the whole country. In a recent report, Dr. Russell, of Glasgow, shows how distant parts of the kingdom are endangered by the scandalous state of things in the capital.

district previously free from infection, in order to suit hospital arrangements, is fraught with danger to the community as a whole, and probably more than counterbalances the good which is effected by removing cases from crowded houses. The vestries on the other hand could make no use of "compulsory notification," even if they could obtain the power. The parishes or districts to which their authority relates are divided by such arbitrary boundaries, and are so mutually dependent on each other, that it would be impossible to regard them as suitable areas for local self-government, or as having interests apart from those of London as a whole.

In a previous paragraph reference is made to the age of superstition when epidemics were looked on as mysterious visitations, to be met by spells and incantations. It is true indeed, that, in this country at least, we have long ceased to regard them in this light, nevertheless, there is no one who could tell the story of their inception and growth in this great city. Here they represent to the bewildered observer nothing but a confused mass of cases, the threads of whose connexion have long become inextricably entangled and practically lost.

Enough has been said to show that "unity" is absolutely essential to efficient municipal self-government. I have chosen that point which appears to me to illustrate this most forcibly. If it were desirable I might continue the argument and show that in several other ways it is highly important for the purposes of sanitary administration. But as my report is already longer than I had intended I will merely allude to one other branch of preventive work which directly influences the spread of infection. It is believed by some that overcrowding may of itself originate the disease called typhus fever; whether this be so or not it is certain that this evil will foster the growth of this and any other contagion such as that of small-pox. Now the Act of 1866 which enabled vestries to make lodging-house regulations for their districts, was specially aimed at overcrowding, and yet of the thirty-nine authorities, only two, Chelsea and Hackney, availed themselves of the power, some of the others having allowed overcrowding to flourish to a shameful extent during all these years. Contagious disease which is rife in one district will extend to that which is

contiguous; it may therefore be truly said that both Chelsea and Hackney have long suffered from the shortcomings of districts over whose action they have no control.

Before concluding, I must very briefly refer to the subject which has been brought under your notice by the St. James's vestry—viz., the transference of vaccination duties from the guardians of the poor to the sanitary authority. My opinion having been asked respecting the desirability of such a change, I have merely to say that I can see little use in bringing it about, unless it is clear that it will be accompanied by improvement. I agree that there is room for improvement in the existing arrangements for public vaccination, and also that the sanitary authority ought by rights to be the authority for the administration of the Vaccination Acts; but it would, in my opinion, be hopeless to expect much advantage from the change in London while things are as at present. If, however, a municipality should be once formed, I think much good might accrue to the community by entrusting this, which is essentially a measure of prevention, to the guardians of the public health, instead of leaving it in the hands of those whose primary function it is to direct the administration of relief to the poor.

# THE PRACTITIONER.

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## Original Communications.

### NOTE ON THE ASTRINGENT ACTION OF COCA AND OF CASTOR OIL.

BY C. E. SHELLY, M.B. CANTAB.

*Hertford.*

THE striking analgesic properties of cocaine have thrown into the shade the stimulating effect upon involuntary muscular fibre with which that anaesthetic action is so intimately connected. Its power of "corrugating and tightening the living fibre," is exemplified in the resulting ischaemia of the mucous surface to which it may have been applied. The tonic action of the coca preparations is doubtless due to the same cause, and probably explains the results observed in the following cases.

C. E., a gentleman aged about thirty, had suffered for some eighteen months prior to January 1882 from a recurrent haemorrhage from the rectum. The bleeding varied in amount and in frequency, was sometimes absent for a month or more at a time, at other times occurred half a dozen times in the day and with or without the passage of faeces. It was never excessive, averaging, when at the worst, about four to six drachms in the twenty-four hours. It was always most marked in cold damp weather. The patient was temperate, had never had

ague or liver trouble, and there was no history of haemophilia. On examination no piles were discoverable, but the mucous membrane of the bowel felt in places rather less smooth than normal: the prostate was slightly enlarged and somewhat tender to palpation. The general health was fair, but the worry and irritation of the discharge, and an almost constant feeling of weight and fulness in the pelvis and perineum, which sometimes made standing for any length of time almost impossible, had helped to reduce the patient to a state of mind which was at times extremely wretched. Careful clothing and dieting, and regular exercise, with gentle laxatives, astringent injections and tonics, failed to give more than slight and temporary relief. One evening, feeling quite unequal to the fulfilment of an engagement at a social entertainment, he took, in faithless desperation, three drachms of an American fluid extract of coca leaves. He was surprised to find himself able to go through his part, which involved standing for more than four hours, not only without inconvenience or fatigue, but with enjoyment. He passed a good night, and on the following morning the bowels acted rather more copiously than usual, but without any bleeding. The haemorrhage did not recur for more than six months, and was then again stopped, for nearly a year, by three two-drachm doses of the coca-extract. Since that date to the present time, the bleeding has twice returned, to be stopped on each occasion by the same means, which also relieves the accompanying sensations of pelvic heat and fulness.

The second case was that of O. H., a middle-aged, fairly healthy business man of very temperate habits—rarely drinking anything but water—who was rather subject to slight rheumatic pains and had suffered from two or three attacks of hepatic congestion. Whenever he got a little “below par,” he began to have bleeding from the lower bowel with each action. This had been the case for several years past, and he had long since found that he could cure himself by drinking a glass of good bottled stout at luncheon and at dinner for three or four days. He sought medical advice because this plan had, however, at last failed him. The condition of the bowel was much as in the previous case, *plus* the shrivelled remains of old external piles; and the usual medicinal treatment was equally in-

efficacious. He was then ordered a drachm and a-half of fluid extract of coca in water three times a day, and the haemorrhage ceased after the fourth dose had been taken. It returned some six months later, and was arrested by the same means, a course of iron and strychnine aiding in the restoration to his usual health. Another case was that of an anaemic lad aged fifteen. Coca promptly checked the bleeding and improved the appetite ; a ferruginous tonic completed the cure. In some cases of menorrhagia in young lax-fibred women, where the undue continuance of the flow seems to depend on a sort of passive and painless oozing from the mucous surface, this has been checked by the coca at the time, and appropriate tonic treatment during one or two successive intervals has restored the patient to a normal condition of health in this respect. In a middle-aged anaemic female subject to painless bleeding from the bowel, coca proved of little service. She was cured by turpentine in five-minim doses six times a day. In almost all instances in which the coca is being taken, the bowels have, at first, acted rather more freely and more easily than usual; subsequently there is often a tendency to comparative constipation; and the motions themselves are paler than normal, with deficiency of bile : as though, perhaps, the tonic action exhibited by the more effectual peristalsis were part of a general astringent effect which lessened the secretion of all the glands, great and small, of the intestinal tract.

In rural France it is held that castor oil arrests the secretion of breast milk. A peasant woman in the puerperal state will not take castor oil as an aperient, believing that to do so would prevent her from being able to suckle her infant, and that she would consequently be more likely to conceive again at an earlier date. Since my attention was directed to this point I have met with some evidence tending to the conclusion that the property thus attributed to castor oil is not wholly imaginary. E. de S. had two full doses of castor oil administered to her three days after the birth of her first child ; the milk, which had begun to appear plentifully, ceased to be secreted and she was unable to nurse the baby. She nursed her second and third children for nine and thirteen months respectively. Castor oil was given before, and on the fourth and sixth days after,

the birth of the fourth child ; the secretion of milk then began to fail and ceased entirely at the end of a week. E. W., a strong and healthy primipara, had no distaste for castor oil. Three days before labour commenced she took, for the first time for several years, a full dose of the oil ; during the first stage of labour she swallowed another three tablespoonfuls. The bowels acted twice, moderately. The breasts, which had previously been full and tense, became remarkably flaccid within twenty-four hours after the last dose, and no milk was secreted until the eighth day. The first patient was a Frenchwoman by birth ; the mother of the second was French ; but ethnic influences can hardly be held to account for these results. In three cases I have observed a moderate dose of castor oil diminish pain and distension of the breasts during the commencing period of milk secretion more effectually than a saline purge and with less evacuant action of the bowels. In a case of threatened mastitis a full dose of castor oil afforded prompt relief to the acute symptoms without producing looseness of the bowels. It is quite in accordance with the principles of popular therapeutics that while the oil is believed to arrest the mammary secretion, the local application of the leaves of the same plant should be credited with galactogogue efficacy. It would seem that this action of the drug is not selective as regards the mammary gland. Its aperient action may be due to its stimulant and tonic effect upon the muscular fibre of the intestine (and a similar action on the unstriped fibres of the uterus would explain its admitted ecbolic tendency when administered during the latter period of pregnancy), while the constipation which follows is largely dependent upon its secondary action in lessening the normal secretion of the intestinal glands.

In two phthisical patients the moderate night sweats commonly experienced were noticed to be absent on the three occasions on which a small aperient dose of castor oil had been taken early in the evening, although ordinary purgatives acting at the same time and to an equal extent produced no noticeable alleviation of this symptom. Another instance suggestive of its special action upon glandular secretion is afforded by the case of a middle-aged gentleman, of business habits, who has

suffered since early manhood from moderate mitral regurgitation. The usual complications of this lesion exist, but not to any marked degree. Every now and again, however, the patient is apt to suffer from dull aching in the region of the liver and under the right shoulder-blade ; he becomes depressed in mind and feels weaker in body. The urine becomes dark, he begins to have a bitter taste in the mouth, the conjunctivæ and even the skin become slightly tinged. All this time the bowels continue to act rather more frequently and copiously than usual, and sometimes there has been vomiting of yellow bilious fluid. Blood seems to be present in the liver in an amount which begets an increased secretion of bile, without the excess becoming so marked as to clog the viscus. Now Mr. H. has found by an experience of more than twenty years that he can always prevent the full development of this group of symptoms by taking, on their first appearance, a tablespoonful of castor oil before breakfast for one or two mornings in succession. The oil acts once, sometimes twice, producing a soft moderately bulky motion of the usual colour. Saline purgatives, the Hunyadi and Friedrichshall waters, seidlitz powers, euonymin and rhubarb, or podophyllin, exert an evacuant action much more marked than that of the castor oil. But, even when continued for several days together, none of them affords him such prompt and effectual relief; nor do they seem to restore the comparative buoyancy of spirit which is experienced after the oil. The good effect of the latter remedy cannot in this case be attributed therefore to a mere mechanical depletion of the portal system ; and one is fain to regard it as being due to a tonic-astringent action affecting the contractile tissue of the ducts and vessels of the liver, mechanically squeezing out the superfluous blood, perhaps aided by a similar tonic effect upon the smaller arteries throughout the body and on the heart itself —together with a diminished functional activity of the secreting tissue of the gland. During an attack such as that described, the pulse is generally slow, very compressible, always irregular, usually intermittent. After the oil has acted satisfactorily it becomes less irregular and gains markedly in tone. Digitalis, and convallaria with strychnine will steady the heart's action and restore regularity to the pulse ; but their use, even when

continued for some weeks, does not relieve the other symptoms unless the oil is taken as well; and they then act much more quickly and efficiently. It would appear, then, that castor oil is something more than "a simple evacuant of the intestinal canal," and that its remote effects are to some extent analogous to those observed in the case of the coca preparations. The subject is one which seems to me worthy of more extended and accurate investigation than I have been able to give to it.

## FEEDING BY RECTUM.

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THERE are many cases in which rectal feeding is beneficial; there are others in which it may become necessary for the saving or the lengthening of the patient's life. But I have no wish to unduly extol the rectal method of feeding, or to suggest its use when the more natural methods are feasible and effective.

The cases with which this paper is concerned may be spoken of as in several groups, loosely associated, for the moment, with reference to their suitability for the use of nutritive enemata.

Thus we may bring together cases such as cut throat, inflammation of throat from the swallowing of caustic substances, diphtheria, diphtheritic paralysis of the throat, severe stomatitis or quinsy, post-pharyngeal abscess. Or, again, where the oesophagus is compressed, or cancerous, or strictured; or in spasm, made worse by attempts to swallow or to pass a tube, such as spasm of oesophagus in cerebritis, and some aggravated cases of hysterical spasm. Laryngeal phthisis, or syphilitic (and other) laryngeal stenosis, with extreme dysphagia, may indicate and justify rectal feeding.

Another group consists of gastric and abdominal affections often associated with vomiting and severe pain on eating—affections such as cancer, ulcer, atrophy, or severe catarrh of stomach; or dilatation of stomach, with severe pain and vomiting; or extreme dyspepsia and irritability of stomach; or obstinate vomiting with ovarian disease, or with hysteria, or of uncertain origin; some cases of obstinate obstruction of intestine

and vomiting, or of ulceration or haemorrhage of small intestine; tabes mesenterica; peritonitis; renal calculus with reflex gastralgia and emesis.

Still another group consists of cases in which nutritive rectal injections may be given in affections such as the anaemias, neuralgia, phthisis, or to supplement the work of the stomach where there is either general or digestive weakness.

There is another group of cases in which the use of rectal feeding is highly advantageous. It consists chiefly of cases of apoplexy, or of excessively frequent and severe epileptic convulsions; or, again, epileptiform seizures, or of severe apoplectiform attacks, with stupor and coma. Seizures of these kinds are to be frequently found in general paralysis, and in various local brain-lesions, such as local sclerosis, or a more diffused sclerosis; in "focal" softening or haemorrhage; in thrombosis, embolism, or the various local pathological sequelæ of these or of brain-injury.

In many of these cases the attempt to feed the patient by mouth ends in the food, whether liquid or solid, being inhaled into the lungs. Even the attempt to feed by stomach-pump, by oesophageal tube, by nasal tube, or by funnel—or, in fact, to in any way get the food into the stomach—is sometimes followed by severe dyspnoea and threatened asphyxia. But the danger to which I would now particularly draw attention is that the introducing of food by this route sometimes occasions vomiting; or vomiting may be present independently of the passing of any tube. Here, then, is a patient who is helpless, or in stupor or coma, or paralysed, or convulsed, or anaesthetic locally, according to the circumstances in each case. If food is now successfully placed in the stomach—and this in many cases is difficult, in some impossible—it may not be retained there, but, being only ineffectually and partially vomited or eructated, may be at once inhaled into the air-passages, be drawn into the bronchioles and alveoli, increase the already existing pulmonary congestion, and, the patient being in a state of depressed vitality, and there being difficulty in the throwing off of secretions and foreign substances by the lungs owing to this, to the local engorgement of the parts, and to the feeble expiratory power at the command of the automatic mechanism—the inhaled

and not expelled food may set up a rapid destructive form of lobular pneumonia, or even of lobular gangrene. Under these circumstances even the salivary and other secretions, if inhaled, appear to be harmful, and the lungs and kidneys are congested for the time, albumen and even blood-cells and casts being often shed by the latter. It is unnecessary to insist upon the importance of rectal feeding in many of these cases.

Tetanus is another form of nervous disease in which rectal feeding is highly serviceable.

As I do not wish to deal with the present subject from the point of view which particularly offers itself to me as a specialist, I shall merely mention—and this only in order that I may not ignore it—the enormous usefulness of rectal feeding in some cases of insanity with refusal of food, if and when the passing of an œsophageal tube causes vomiting or severe dyspnoea, or with such insane persons as refuse food and resist being fed, when, by reason of their diseased state of brain, heart, or lungs, efforts and straining against the stomach-tube endanger life.

In all these cases rectal feeding is useful when food is refused, or if swallowed tends to get into the bronchi; or when the passing of a tube brings on vomiting or suffocative spasm; or when the food regurgitates, or is vomited with likelihood of getting into the air-passages; or when the resistance made by the patient endangers life, owing to the effects of effort upon frail, but vitally important, organs.

If, then, one *has* decided to feed by rectum, the next questions are: What is the best form of nutriment to employ, and what are the best special modes of manipulation in introducing the food into the bowel?

As to the former, the question of the best form of nutriment to use for injection, the older plan, and the one still most in vogue, is merely to inject fluid food and stimulants, not specially prepared, but in the form in which they are taken by mouth. Beef-tea, milk, and brandy have been largely used for this purpose, and I have heard of arrowroot being so used in considerable quantities. Some amount of stimulation can be attained by the use of some of the substances just named, and from them can be absorbed constituents which enable the

nutritive powers to better utilise the stores of nutriment already within the system. But for true food-purposes their value is apparently slight. As Dr. Sansom stated (*Lancet*, February 19th, 1881) only a fractional proportion of the albuminous contents of nutritive enemata, as commonly employed, is taken up into the blood current to subserve any useful purpose of nutrition. This fact has led to many attempts to improve upon the ordinary nutritive enemata.

The use of various digestive substances with the food injected has been tried, and various experiments, as well as observations, having practically the bearing of experiments, have been made.

Thus M. Catillon<sup>1</sup> fed two dogs for two months by rectal injections of eggs only; one, which received eggs only, lived with difficulty and lost weight; the other, which had eggs, glycerine, and pepsine, kept well and kept up weight, but when the pepsine was omitted, he, too, lost weight, and his temperature fell.

In further observations, firstly, meat, bread, and potatoes were taken, then no meat for three days, and the amount of urea excreted and the body-weight both fell; then for one week peptones of meat were taken, and the urea and weight went up again; next, for four days enemata of peptones only, and the weight was constant, and the urea proportioned to it; next, low diet, no meat or peptones, and urea and weight fell. For a sustaining ration he suggests about 5 ozs. of saturated solution of peptone, and for nutritive enemata, peptone of meat (saturated solution at 19° C.) 40 grammes, water 125 grammes, laudanum drops iii., sodii bicarb. 3 gramme (about 5 grains).

Czerny and Latschenberger,<sup>2</sup> whose experiments were conducted on a man's colon, through fistulæ following gangrene of an irreducible scrotal hernia, found that while little benefit comes from raw material in the bowel, much improvement in health and strength results if substances are previously partly digested, as, for instance, if fat is emulsified, albumen reduced to a soluble state, and starch converted into glucose.

Marchwald<sup>3</sup> is rather a pessimist in this matter. From his

<sup>1</sup> *Brit. Med. Journ.* Sept. 18, 1880, p. 485.

<sup>2</sup> *Virchow's Archiv*, lix. Bd. ii. Heft (quoted *Lancet*, Feb. 7, 1874, p. 206).

<sup>3</sup> *Virchow's Archiv* (quoted *Lancet*, Jan. 8, 1876, p. 59).

observations on a case in which the anterior wall of a cæcal hernia had sloughed, he concluded that the colon does not convert starch into sugar, nor digest fibrin or coagulated albumen, though putrefaction occurred and peptones formed; nor absorb ready-made peptones or fluid albumen; while it absorbs water slowly, and a little peptone, especially that formed in the bowel itself.

On the whole, I conclude that the rectum and colon digest but little, and that, even when inverse peristalsis is set up, the action of the bowel upon enemata is chiefly absorptive. If so, the food should either be introduced mixed with digestive substances, or else before administration should, in some way or in some measure, be digested and ready for absorption into the venules and lymphatics of the intestinal walls. Several methods have been devised to attain these objects.

Thus Dr. Leube<sup>1</sup> gives three parts of meat with one part of pancreas, both finely minced and mixed with a little water. An addition of fat does not harm the digestion of the meat and pancreas when injected, but more than one-sixth of fat is apt to cause stool. Brown-Séquard's<sup>2</sup> plan is first to clear out the bowel by an enema of luke-warm water, and then by a wooden syringe inject into the bowel two-thirds of a pound of raw beef and a quarter of a pound of hog's pancreas. Repeat twice a day. The pancreas must be fresh, the animal recently slaughtered, the fat and cellular tissue taken away. The meat and pancreas must be very finely divided, and thoroughly mixed. M. Catillon's formula I have already given above, when speaking of his experiments; it represents a peptone of meat. M. Henninger<sup>3</sup> gives a complicated formula for a peptone of meat by digestion of meat under HCl. and pepsine. Slinger<sup>4</sup> has manufactured a nutrient suppository, consisting of nearly pure peptones, made by digesting lean meat with the mucous membrane of the pig's stomach. Numerous new preparations are brought before the profession each year.

Defibrinated blood and solutions of desiccated blood have been used for enemata, and especially in America. Three years ago, when I was on that side of the water, and met some medical

<sup>1</sup> "Ueber die Ernährung," &c. (quoted *Lancet*, Oct. 12, 1872, p. 529).

<sup>2</sup> *Lancet*, Jan. 26, 1878, p. 144.

<sup>3</sup> *Paris Médical*, 1881, No. 29; *Brit. Med. Journ.* Sept. 24, 1881, p. 544.

<sup>4</sup> *Brit. Med. Journ.* Sept. 19, 1881, p. 271.

men in consultation in reference to a certain case in which the question of feeding by rectum arose, I found that the medical attendant at once suggested a solution of desiccated blood, which is usually employed there, I believe, in the proportion of one to eight of water for injection. Fresh defibrinated ox or sheep blood appears to be considerably used in America for nutritive enemata, as Dr. Sansom was one of the first to tell us.

In his Lumleian Lectures Dr. W. Roberts<sup>1</sup> states that "pancreatic extract is peculiarly adapted for administration with nutritive enemata. The enemata may be prepared in the usual way with milk-gruel and beef-tea, and a dessert spoonful of liquor pancreaticus should be added to it just before administration. In the warm temperature of the bowel the ferments find a favourable medium for their action on the nutritive materials with which they are mixed, and there is no acid secretion to interfere with the completion of the digestive process."

In actual practice I have departed considerably from this plan of Dr. Roberts's, preferring to inject food in the already peptonised form, and ready to pass from the bowel by absorption. For enemata, therefore, I have used, in a slightly modified form, his method of preparing the food as if for administration by mouth. A thermometer being employed throughout, and either kept in the liquid or frequently introduced to test the temperature, a pint of milk with one-fifth or one-fourth pint of water is heated in a clean dish to 140° F. At that temperature, two drachms of Benger's liquor pancreaticus are added, and twenty grains of bicarbonate of sodium dissolved in a spoonful of water. The whole is put into a covered jug or dish, and kept near a fire for from an hour to an hour and a-half, and still kept constantly at a temperature of 140° F. At the end of that time it must be thoroughly boiled for two or three minutes. Each step should be carefully carried out to secure success. Thus prepared, the food keeps for a half a day or more. For convenience, I have given the process as for one pint of milk, but multiples of that measure may be prepared. In feeding by rectum I prefer to keep to this peptonised milk solely.

The following, from Dr. Roberts, chiefly useful for administration by mouth, may be given by rectum also.

<sup>1</sup> *Lancet*, May 29, 1880, p. 828.

For peptonised gruel : wheaten flour, oatmeal, arrowroot, sago, pearl barley, pea or lentil flour, gruel well boiled, thick and strong, Oj ; put in a covered jug, cool to about 140° F., add liq. pancreatici ʒss. Keep warm under a cosey for two hours, boil and strain.

For peptonised milk gruel : thick hot gruel, cold milk, equal parts. To each pint add liq. pancreatici ʒij—iij., and sodii bicarb. grs. xx. Keep warm in covered jug for two hours ; boil for a few minutes and strain.

For peptonised beef tea : half pound finely minced lean beef, water a pint, sodii bicarb. grs. xx. ; simmer for one hour and half ; cool to 140° F. ; add liq. pancreatici ʒss. Keep warm under cosey for two hours ; occasionally shake. Decant liquid portion and boil for five minutes.

## THE PRESENT STATE OF THE ERGOT QUESTION.

BY RUDOLF KOBERT, M.D

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ABOUT the beginning of this year there appeared in this journal a short article upon the active principles of ergot of rye. Since then I have continued my investigations and have more particularly devoted my attention to their influence upon the pregnant uterus.

*Ergotinic Acid* :—As regards this substance and its sodium salt, I may say I have administered it internally and hypodermically to pregnant bitches, rabbits, cats and sheep. The doses given were at first small, and then increased till finally they were toxic. The results of all these experiments entirely agreed with my former ones: when administered internally even the largest doses are well borne, without the supervention of uterine contractions and without any material disturbance of the mother. At most the stools become semi-fluid. When injected subcutaneously, relatively large doses cause complete narcosis lasting twenty-four to forty-eight hours, during which reflex action ceases; nevertheless neither contraction of the uterus nor expulsion of the young occurs.

After very large doses the blood-pressure falls very low and as a consequence the young die but are not expelled.

From these experiments it will be seen that ergot of rye does not owe its ecbolic power to the ergotinic acid contained in it, and that we may consider as clinically worthless all preparations of ergotinic acid, and of sclerotinic acid (so called), and all aqueous extracts which do not contain those principles which are soluble in alcohol. Hence it follows, that the

extractum secalis cornuti of the *Pharmacopœia Germanica*, Editio II. is worthless.

*Cornutine* :—This substance is now prepared and supplied commercially by Gehe and Co. (Dresden): and is not to be confounded with the very different *Ergotinine* of Tanret. The latter is quite inert. The former however produces uterine contractions both in animals which are pregnant and in those which are not pregnant, but with this difference, that in the latter the contractions are accompanied by coincident vomiting, diarrhoea, salivation and irregularity of the pulse; but in the former the irritability of the uterus is much increased, and as a consequence the uterine movements come on after doses so small that no other symptoms at all appear. Consequently it was always possible, in dogs and cats, to bring about the expulsion of the foetus without seriously jeopardising the life of the mother, when the cornutine was injected subcutaneously. It was a matter of no consequence whether the young were mature or not. The amount necessary to this result was less than an eighth of a grain. Gehe's preparation, not being as yet a chemically pure one, must be administered in larger doses.

*Sphacelinic Acid* :—This is a resinous body, insoluble in water, and consequently must be administered by mouth in the form of an emulsion. In dogs and cats a sufficient dose never failed to evoke powerful labour pains in the pregnant uterus followed rapidly by the birth of the foetus: yet not one of the mother animals lost her life in consequence. The contractions after this substance we may describe as being tonic, and after the cornutine as being clonic.

From the foregoing it will be seen that in the ecbolic action caused by ergot both cornutine and sphacelinic acid take part.

As hinted at in my previous communication to this journal, cornutine acts by influencing directly the centre for the uterine contractions situated in the spinal cord; but sphacelinic acid acts directly upon the uterus itself. And the combined action of these two substances is necessary if we wish to produce the action of ergot upon the uterus and yet avoid any other untoward effects. Therefore the only rational preparation for use in cases of parturition is one which contains all the

cornutine and sphacelinic acid but no ergotinic acid; for the latter is very injurious to the stomach and has no influence upon the uterus. At my desire Gehe and Co. (Dresden) have been good enough to prepare and supply commercially an article answering the above indications (*extractum secalis cornuti cornutino-sphacelinicum Kobert*). This is of course not in any way identical with other ergotines now in the market. Internally administered it was *when fresh* exceedingly active, producing abortion with absolute certainty in pregnant animals. In the form of pills it has been employed with success in man to stop haemorrhages in various organs and also in the treatment of vascular dilatation in cutaneous diseases. Unfortunately it does not keep well for more than six months and must each year be prepared afresh; a preparation a year old is almost absolutely worthless. *It is necessary to state that neither ergot itself nor any of the numerous commercial and European and American preparations which I have examined have retained their therapeutic powers for more than twelve months.* Of course the ergotinic acid remains unaffected, but this is valueless.

The preparation of an active extract depends upon the solubility of cornutine and sphacelinic acid in absolute alcohol, in which latter ergotinic acid is insoluble.

It is only necessary to bruise well the fresh ergot and to exhaust thoroughly with the strongest alcohol. After evaporation of the alcohol at a low temperature there remains a residue consisting of the inert fatty oil and the whole of the cornutine and sphacelinic acid. A portion of the oil may be previously got rid of by extracting with ether but at the sacrifice of a small amount of the active substances. The extract thus prepared is not well suited for subcutaneous injection. The dose cannot be foretold, because the proportion of active principles present in ergot varies exceedingly with the year and the district.

As the extract of ergot is usually prepared in November, it is to be hoped that this article will be of the greater utility.

## ON THE PHARMACOLOGICAL ACTION AND THERAPEUTIC APPLICATION OF SOME ETHEREAL SALTS OF CARBAMIC ACID.

BY O. SCHMIEDEBERG,

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(Continued from p. 332.)

### III. *On the principles of Selection amongst Compounds of the Fatty Series, as Hypnotics and Calmatives, and on the practical application of Urethane.*

The diminished irritability of various cerebral regions to external and internal stimuli, by suitable doses of members of the alcohol-group of bodies, leads to a general tranquillity, and under suitable conditions readily induces sleep, especially when its occurrence has been hindered or prevented by morbidly increased sensitiveness of the parts of the brain in question. This action is, to a certain extent, common to all members of this pharmacological group. But all members of it are by no means suitable for use in practice. In the first place, those compounds which are very volatile but insoluble in water are hardly suitable for application as hypnotics. They are no doubt readily absorbed, but on account of their volatility they are again rapidly excreted, especially through the lungs. If we wished to produce, by the inhalation of chloroform, instead of profound narcosis, only the slight degree of action required to obtain sleep, we should be obliged to continue the inhalation evenly and just to the right extent as long as the sleep lasted, which of course is impracticable.

If, on the other hand, we administer chloroform internally, as was frequently done formerly, so as to allow it to pass gradually

and evenly into the blood, great irritation of the stomach, with its unpleasant consequences, readily occurs. An injurious action of this kind is not so much to be feared in the case of substances which are readily soluble in water, because they diffuse equally throughout the contents of the stomach, and therefore only come into contact with the gastric mucous membrane in a dilute condition. Chloral hydrate fulfils these requirements completely, although when used for a long time it is not without an injurious action on the gastric mucous membrane.

Its actions in other directions are more disturbing and more dangerous. For its action is not confined to the functions of the cerebrum, but extends even in its slighter stages, especially when long continued, to the centres of reflex action, the respiratory and vaso-motor centres, and even to the motor ganglia of the heart. The halogen compounds have a specially powerful action in this respect. The irritability of the organs just mentioned is no doubt only slightly diminished by the ordinary mode of using chloral hydrate, yet, nevertheless, the diminution is sufficient in many cases to induce very disagreeable consequences.

As reflex stimuli play an essential part in exciting respiratory movements, substances which, like chloral hydrate, diminish reflex irritability, favour to a great extent that shallowness of the respiratory movements which usually occurs during sleep. This effect is greatly increased in another way. It often happens that only a very slight degree of narcotic action, a mere impulse towards sleep, is sufficient to induce it. When sleep has once occurred it generally goes on becoming deeper of its own accord, and in this case still continues when the narcotic action of the medicine has completely passed off in consequence of its excretion or decomposition.

Similar phenomena occur in other parts of the body. The slight diminution of excitability in the respiratory centre produced by chloral hydrate may be sufficient during sleep to produce an increasing shallowness of the respiratory movements in a similar way to the deepening of the sleep itself, *i.e.* here also the final effect is greater than that at the beginning, although the cause has remained the same or even become less.

In the waking condition such an action of chloral hydrate would not be perceptible. In sleep, however, it may become so powerful as to lead to disturbance of the respiratory changes, and in consequence of them, not only to awakening, but also to serious danger, especially when the vaso-motor centres and the cardiac ganglia have become affected in a similar manner, and imperfect circulation has thus been associated with respiratory disturbances. The unpleasant and injurious consequences of these actions of chloral are specially marked in cases where the functions just mentioned have been weakened by disease and lack their normal energy. Those substances which are free from chlorine, bromine, or iodine have a much less powerful action on the vaso-motor and respiratory centres, as well as on the cardiac ganglia, than chloral hydrate or than halogen compounds in general, which have an action like it in this respect.

The compounds which contain no chlorine, bromine, or iodine are, therefore, much less dangerous than those which do, and consequently may be used in those morbid conditions in which the use of chloral hydrate is doubtful. Their number, however, is very limited, for most of them are insoluble in water, and therefore, for the reasons already given, are unsuitable as hypnotics.

Amongst the alcohols, common alcohol is not suitable as a hypnotic, because, apart from other reasons, at the same time that it dulls the sensibility it affects the mental functions specially, and in such a way that the ideas readily become confused and then have an exciting action.

The other alcohols which are soluble in water have been very little examined or not at all. Some tertiary alcohols, *e.g.* trimethyl- and dimethyl-ethyl-carbinol, are especially deserving of attention, as they are already to be had commercially, and probably they might be found useful in many cases.

Amongst the other halogen-free compounds soluble in water, some aldehydes require especial consideration. Common aldehyde is out of the question on account of its irritant action, but a polymeric product of it, paraldehyde, has been brought into tolerably extensive use as a hypnotic by the experiments of Cervello on the lines I have indicated. This substance does as much as one can expect from a hypnotic belonging to this group. It lessens the irritability and sensibility of the brain in

the requisite way without producing any marked secondary effects. Whether sleep occurs or not depends on other conditions which have nothing to do with the drug, or may act in opposition to it. Amongst these we may mention conditions of excitement, which are not directly soothed by paraldehyde (*e.g.* convulsive attacks), and which act reflexly on the brain, so that the occurrence of sleep is prevented or it is broken. Although paraldehyde fulfils all reasonable demands in regard to its action, yet it has by no means an agreeable taste, and has a strong, persistent and suffocative smell, which like other intense impressions on the organs of sense, may disturb or prevent the occurrence of sleep in many cases. It is, therefore, very desirable to find a drug which will have the same action as paraldehyde and be free from its disagreeable properties. Amongst the other polymers of aldehyde aldol must be considered, which is formed from aldehyde and met- and par-aldehyde, and is regarded as oxybutyric-aldehyde. According to this view of its structure it contains two atoms of oxygen in the molecule, and this is in perfect agreement with its weak action, which has been determined experimentally. This compound is also difficult to prepare pure, and it is unstable.

From the preceding remarks it is evident that the number of compounds in the fatty series which can be used as hypnotics is very limited, and on this account attention was all the more to be directed to urethane, which in many respects has admirable qualities.

I can here only discuss, in a few words, according to the principles just laid down, the question how far, and in what cases, the action of urethane, as determined by experiments on animals, promises to be useful in its practical application to man. My colleague, Professor Jolly, has already tried it on a series of patients, and will shortly publish his results.

In regard to the higher degrees of narcosis, such as are requisite for surgical operations, it is evident that these cannot well be induced by urethane any more than by chloral. We are therefore limited for therapeutic purposes to the first degree of action of urethane, namely, diminution of general sensibility and diminution of certain mental functions. This action is in general evidenced in man by the attention and interest in the

outer world, as well as in one's own ideas, becoming diminished, and consequently there is a less tendency to voluntary movement, and a greater desire for rest. The special symptoms and the further consequences of this condition may appear in somewhat varying forms in different individuals, and in different diseases. A healthy man who has slept well during the night will in many cases be very little affected on the day after taking the medicine, especially when there was no intention to produce these effects. Heaviness of the head and other symptoms of slight intoxication may however appear.

On the other hand, if there has been a need for quiet and sleep, whose occurrence has been hindered by conditions of cerebral excitement, the medicine will in many cases be very serviceable if the dose is sufficient. The rule for using it is, not to give too much at once, but to give small doses frequently repeated, because if a large dose is given at once, vomiting sometimes occurs, as experiments on dogs have shown. Apart from this condition, no anxiety need be felt regarding the dose, because, as already mentioned, urethane, in contradistinction to chloral hydrate, has no injurious action on respiration or circulation. On the respiration indeed it acts rather as a stimulant, and thus differs from paraldehyde, and in the doses which we are here discussing it leaves the reflex irritability intact. In this respect it agrees with morphine, although it does not lessen pain to anything like the same extent.

Urethane can therefore be used in general as a hypnotic, and we foresee that it will frequently be of especial use in those cases where the smell and taste of paraldehyde interfere with its use, and where the action of chloral hydrate on the heart, vessels, and respiration must be avoided. This compound is no more a universal remedy to produce sleep than any other substance, but a consideration of its pharmacological relations will enable the practitioner to choose the cases correctly in which a satisfactory result is to be expected from it; while tentative trials without any definite plan will here, just as in the application of medicines in general, lead to the disappointment of cherished expectations.

## THE TREATMENT OF ALBUMINURIA.

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(Continued from p. 327.)

The old-fashioned division of diseases into acute and chronic has, even yet, some advantages over more scientific systems of classification. The methods by which indications for treatment are ascertained must not demand lengthy processes of observation or analysis, and must lend themselves readily to the requirements of clinical practice. The certain knowledge which the more elaborate procedure of the organic chemist or physiologist gives us cannot always be gained in time to serve the patient who needs our help; and although each year places within our reach more easily employed and more trustworthy means of diagnosis, we shall not for some time to come, if ever, be able finally to discard the older, less minutely accurate, but within their scope singularly efficient methods of practical medicine.

Having already stated the general principles which ought to guide us in the management of albuminuria, it will be convenient to discuss in greater detail the treatment of (1) acute; (2) chronic albuminuria; (3) complications or sequelæ.

Should it prove impossible to adhere strictly to this, or, indeed, to any other division, the discussion will but conform to the character of the disease itself, which is essentially a mixed one. No doubt we do meet from time to time with what seem to be typical examples of the various forms of nephritic disease, parenchymatous, interstitial, vascular, and nervous; or, to adopt a different principle of classification, with cases of fatty, fibroid, and lardaceous change, &c. But in the pathological

theatre we seldom meet with kidneys which have suffered in one tissue only, have undergone but one form of degeneration. And the clinical history of a large number of cases presents the same blending of symptoms during life as after death we find must have existed also in the case of morbid histological changes.

For instance, the following short general description recalls fairly enough the main features of very many cases of albuminuria. When first seen, the patient presents the usual symptoms of acute renal dropsy : but perhaps at this time, perhaps as the acute symptoms decline, it is noticed that the pulse is firmer, the arteries thicker, the heart larger, local dropsies, as of the conjunctivæ, more marked than the apparently recent access of the malady would lead us to expect them to be. On inquiry we learn that he has had a similar attack of dropsy years ago, and it may be two or three subsequent ones at uncertain intervals. The case may terminate either during one of the intercurrent acute attacks, or by the gradual development of a persistent fibrosis. Of course there is nothing in this peculiar to renal disease. The case is closely analogous to that of the sufferer from emphysema or from fibrosis of the lungs, with intercurrent attacks of bronchitis or of pneumonia, and also to that of cirrhosis of the liver, in which acute congestion and catarrhal jaundice are of frequent occurrence, while now and then the patients succumb to acute yellow atrophy. But in treating the symptoms or the form of disease which for the time is the dominant factor in our patient's condition, it is important to remember that the presence of some other morbid process will call for more or less modification in the nature and in the activity of the remedial measures which we employ.

1. The treatment of acute febrile albuminuria (parenchymatous nephritis). If this be the result of some acute febrile disorder or of exposure to cold and damp, and the patient be young and previously healthy, complete recovery may be confidently expected in the majority of cases, provided that the patient be able and willing to submit to the necessary restraint for a few weeks, and has come under treatment at an early period of his illness.

Until the albumen has entirely, or all but entirely, disappeared

from the urine, his bed, or at any rate his bed-room, is the only safe place for him. The strictness of the care with which he should be protected from any risk of a chill will depend partly upon the character of his home, partly upon the season of the year. A liberty dangerous in March might be quite safe or even advantageous in July. But at any season, and anywhere, he ought to remain in bed until the amount of albumen has very greatly diminished. For not only the rapidity but the completeness also of his restoration to health will be greatly furthered by his recovery not being for a moment checked by any untoward accident or indiscretion. The treatment of simple uncomplicated cases has been already sufficiently considered in the last number of the *Practitioner*; it only remains here to add one or two remarks about the severer cases. If the urine contains much blood in the early stages, and is very scanty, much relief is often given by moderate doses of digitalis  $\text{m}$  v. to  $\text{m}$  x. of the tincture, or half a drachm to two drachms of the infusion four or six times a day; and it is also well to give the first three or four doses at shorter intervals, *e.g.* every two or three hours. Young patients especially seem to benefit by this. At the same time the congestion of the kidneys is certainly relieved by the application of dry cups over the loins. I generally use three on each side, one over the last rib, with one just above and below it. Sometimes the application over the hypogastrium of a large hot poultice, which may be made with infusion of digitalis four times as strong as the pharmacopœial preparation, is soon followed by an increased secretion of urine, and if there is any tendency to constipation some of the stronger purgatives, scammony or elaterium, or larger doses of the milder ones, must be exhibited. If the patient be restless, and does not obtain sufficient sleep, chloral hydras, in doses of ten or fifteen grains, which may be repeated if necessary, is a very efficient and safe hypnotic. Opium and its preparations if used at all, must be so with the utmost caution. The subcutaneous injection of small doses of morphia, from the twelfth to the eighth of a grain, is the safest method. I have no doubt that I have seen cases of albuminuria terminate in coma, and that not uræmic, after a moderate dose of an opiate. In the acute stage it is very rarely necessary to relieve the dropsy by tapping, but if the case takes an un-

favourable course, and the anasarca becomes excessive, the best means to use are very fine trocars (Southey's trocars) provided with long and fine indiarubber tubes so that the fluid may run off into a vessel on the floor without wetting the bedclothes. Care must be taken that the trocar and cannula are perfectly clean ; and it is well not to allow the latter to remain more than eight or ten hours in the same place. They ought then to be removed, and, if still required, inserted afresh elsewhere, the first opening being closed. The danger, by no means an imaginary one, of their setting up erysipelas or thrombosis increases with the length of time during which they are allowed to remain in one and the same place. If convalescence does not make satisfactory progress, cannabis indica, ten minims of the tincture three or four times a day, is often of service, and, if it can be safely obtained, change of air, especially to the seaside. In the later stages of convalescence there is no drug equal to iron, and, if it can be assimilated, the tincture of the perchloride is the best preparation. If that disagrees it is still worth while to try some of the milder forms, such as the syrupus ferri phosphatis or the ferri et ammonii citras. Even in severe and unfavourable cases, a steady perseverance in the mode of living and in the diet, already mentioned, which are sanctioned by physiology, will often succeed in effecting a cure, but to secure this it is essential to win and retain the confidence of your patient and of his friends. Without this it is difficult to avoid becoming engaged in an interesting, but for the most part fruitless, course of experimental pharmacology.

There is good reason to believe that sometimes the access of interstitial nephritis is marked by an attack of acute renal dropsy, in the same way that fibroid phthisis may begin with an interstitial pneumonia, and osteo-arthritis with an acute illness very closely resembling ordinary rheumatic fever. But I know no means by which a certain diagnosis can be made in the acute stage, nor, supposing this to be possible, any indication for a line of treatment differing from that of acute parenchymatous nephritis, although of course the issue of the case would be much less satisfactory.

2. Chronic Albuminuria (interstitial nephritis).—It is essen-

tially a chronic disease. For many months, sometimes even years, it is often difficult to persuade the patient that his condition is one of serious, though it may be remote, danger. The indications for treatment, so far as the kidneys are concerned, are practically the same as in the acute forms of nephritis, but in fulfilling them we have a slightly different end in view, and there are certain special complications, notably the vascular changes, against which we have it in our power to take certain special precautions.

In the earlier stages we have, not to relieve our patient from urgent, though temporary, symptoms, but to enable him to live with as little strain as possible upon the excretory functions of the kidneys. Diaphoretics, purgatives, and a carefully-regulated diet, especially as regards the amount of albumen contained in it, are still the chief factors in our treatment; but they have to be employed continuously for long periods, and consequently their activity must be carefully adjusted, so as not to be followed by the exhaustion of the organs to which they are directed. It is impossible to lay down any rules equally applicable to all cases, or even to the same case at different periods. Each must be carefully studied, and the details of treatment directed by the individual peculiarities of his constitution. One may get more relief from the judicious use of purgatives, another from that of diaphoretics. In fact we have to ascertain on what organ or function we can best rely for the discharge of an extra amount of daily work supplementary to that of the kidneys. Hot air baths, or Turkish baths, must be employed, but not very frequently; and the use of purgatives must not be such as to be followed by constipation. If the liver, as often happens, is involved in the same fibroid change, a five or six weeks' course of ammonii chloridum, provided always that it does not set up gastric trouble, is often of great service. I believe, indeed, that it is well worth while to try it, even when no change in the liver can be detected. We have to keep the general health as perfect as possible, but to do so without losing sight of the damaged state of the kidneys. Change of air, if possible to the seaside, or a sea voyage, are potent for good, if the patient has sufficient self-control to avoid their special risks. The

vascular and cardiac changes require treatment of a different kind, which, however, must not be pushed so as to endanger the general health. We have it in our power to diminish the intra-arterial tension from time to time, and in proportion to the degree in which this is accomplished we shall retard the development of that arterial degeneration and left ventricle hypertrophy which are such fatal elements in the disease.

On the whole, nitro-glycerine seems to be the best drug to employ for this purpose ; but in the dose and in the frequency of its repetition we must be guided by the effect. Perhaps nitrite of potassium in small doses might also be given, but I have no experience of its use in chronic Bright's disease. There is one drug which demands special mention, for it is sometimes most valuable, sometimes most dangerous, viz. iron. One of the best of cardiac tonics—I had almost said cardiac foods—it finds its proper place in the earlier periods of the disease. Then, by improving the nutrition, and thus increasing the vigour of the heart, it enables a comparatively small amount of muscular tissue to exert a large amount of force, and thus delays the advent of serious hypertrophy, and the greater the degree of hypertrophy the nearer is degeneration, with all its hopeless consequences. But towards the end of the disease, when the heart is already greatly hypertrophied, and the arteries degenerated and brittle, the incautious administration of iron gives to the contraction of the heart a power which the weakened vessels are unable to resist, and thus directly brings about cerebral haemorrhage, one of the most frequent terminations of chronic albuminuria.

3. Albuminuria dependent upon lardaceous disease of the kidneys may unfortunately be dismissed in very few words. Whatever be the case with interstitial nephritis, lardaceous change is always secondary to some pre-existing malady, and, except so far as it embarrasses the management of that malady, admits of no special treatment. Further, the change generally involves many other organs, some of them not less vital than the kidneys. Whatever its cause may be—syphilis, protracted suppuration, malaria, or exhausting discharges of almost every kind—it is that cause which we have to treat. The most hopeful form is the syphilitic, and in that I have seen great temporary improve-

ment follow upon the use of perchloride of mercury and iodide of potassium, but I have never seen cure. Perhaps I might have believed that some did recover, had they passed sooner from under my observation. Most reluctantly I am compelled to place it in the class of diseases tersely described by a friend to whom, some years ago, I incautiously disclosed my then unbounded faith in therapeutics. "Yes, these cases often get well, but the patients always die."

*(To be continued.)*

## SHORT NOTES ON THERAPEUTICS.

BY H. MACNAUGHTON JONES, M.D., F.R.C.S.I. AND EDIN.

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(Continued from p. 338.)

### AURAL THERAPEUTICS.

*Tinnitus Aurium.*—Perhaps this symptom, so frequently met with on the threshold of our inquiries into the history of an aural case, is the most unsatisfactory that we have to deal with in its subsequent management. And in relation to our prognosis we may safely say that it renders a large proportion of patients less amenable to treatment, and points to graver mischief than that which we can combat with local or general remedies. This statement applies more particularly to that tinnitus which is due to non-inflammatory changes in the middle ear, or abnormal conditions of equilibration in the labyrinth, whether these latter conditions are *primary*, having their origin in intra-labyrinthine changes, such as hyperæmia, apoplexies, atrophies and paralyses of the nerve, new growths, the results of suppuration, syphilis; or *secondary*, and due to morbid states of the middle ear, producing, through altered mobility in the ossicles and especially the stapes, pressure on the fenestra, increase of tension in the labyrinthine fluid, and pressure on the basilar membrane and the elements of Corti. Such alterations in the conditions of equilibration and the correlative functional changes in the vibrating media of the middle ear and labyrinth, which are essential for the transmission of sound-waves, are quite independent of a *third group* of disturbances which have their source in certain cerebral and cerebro-spinal changes, and which latter in two different methods affect the organ of hearing, either by

the spread of disease directly to the labyrinth through the auditory nerve, or by pressure indirectly bringing about similar functional effects, as in the case of cerebral tumours, encephalitis, spinal arachnitis, hydrocephalus. Nor do they include a *fourth class* of reflex disturbances, which arise from remote organic or functional affections, whether in brain, spinal cord, stomach, heart, kidney, or uterus, and which are associated with noises in the ear; while there is, at least for a considerable time, no corresponding structural deviation in the middle or internal ear. Persistent tinnitus we may look on, in a large proportion of cases, as indicative of some permanent change in the auditory structures, and in the vascular or nervous supplies. Not infrequently these vascular departures from the normal state are the consequences of disease in some of the viscera, more frequently the heart or kidney. The undulatory disturbances in the vibrating media may start from the fluid in the labyrinth, the blood in the vessels, the air in the tympanic cavities, the air in the meatus; while we may relatively trace the altered pressure or tension to such causes as increase in the cerebro-spinal fluid or displacement of it, atheromatous degeneration in the auditory vessels, cardiac disease with its corresponding change of vascular tension, disease of the osseous structure in the petrous portion of the temporal bone, relaxed states or increased tension of the tubal or intra-tympanic muscles, adhesions in the tympanic cavities, ankyloses of the ossicles, or limited mobility in the articulations, mucus in the tympanum, rigidity, collapse, or displacement of the membrana tympani, perforation, the presence of any foreign substance in the external meatus, or encroachment on the lumen of the canal from a growth or inflammation. We might thus tabulate, following the scheme of our classification (page 335), the pathological causes of tinnitus:—

#### EXTERNAL EAR:

Inflammation.

Cerumen and collection of epidermis.

Polypi.

Exostosis.

Othœmatoma.

Foreign bodies.

**MIDDLE EAR:**

Alterations in the shape, position, consistency, mobility and integrity of the membrana tympani—adhesions.

Ossicular changes, adhesions, ankyloses, rigidity, displacements.

Thickening of the mucous membrane.

Inspissated collections of mucus, pus, aspergillum.

Fluid exudations.

Small tumours.

Spasm and variation in tension of the tympanic muscles.

Relaxation and enervation of the muscles of the soft palate and Eustachian tube.

Collapse or closure of the Eustachian tube.

Atheromatous degeneration of the arteries and aneurismal dilatations.

Blood extravasations (Menière's disease).

Increased or diminished tension in the arteries (including the action of drugs on the tension of the vessels of the tympanic membrane and drum cavity).

Venous congestion and fulness within the lateral, petrosal, and transverse sinuses.

Disease of the mastoid cells.

Disease of the petrous portion of the temporal bone.

**INTERNAL EAR:**

(1) *Increase of labyrinthine pressure* (principally arising from two causes, (*a*) increase of fluid, (*b*) rigidity of, or pressure on, either of the fenestræ).

(2) *Vascular changes*, general increase of blood-pressure or diminution, frequently associated with cardiac disease and morbid or irritable blood states (anaemic or toxæmic); anaemia of the labyrinth or hyperæmia (the result frequently of mental shock, overwork, or worry), apoplexies, extravasations.

(3) *Nerve changes*, (*a*) hyperæsthesia, pareses (organic and functional), atrophies, scleroses, traumatisms.

(4) *Rheumatic, gouty, syphilitic affections*.

(5) *Reflex disturbances*, in various uterine disorders,

pregnancy, gastric derangement, dyspepsia, hepatic derangement, hysteria, spinal neuroses.

(6) *Cerebral and cerebro-spinal affections*, tumours, secondary degenerative changes, apoplexies, effusions, thrombi.

(7) *Therapeutic*, i.e. the action of such drugs as nitro-glycerine, alcohol, ether, quinine, salicine, santonine, caffeine, apomorphine, nitrite of amyl, tobacco, iodine, iodoform, chloride of barium, digitalis, convallaria, atropine, veratrine, duboisine, gelsemine, jaborandi, monobromide of camphor, hydrobromic acid.

And here it may be well to remember some special anatomical facts in connexion with the vascular and nervous supplies of the labyrinth, which have an important bearing on the varieties and treatment of tinnitus. For brevity's sake I shall tabulate these :—

(a) The communication between the arachnoid space (cerebro-spinal cavity) and the fluid perilymph of the labyrinth through the aqueductus cochleæ; (b) the arterial supply of the labyrinth through the basilar artery, with the semicircular canals and cochleæ; (c) the venous discharge of the labyrinth into the petrosal sinus and jugular vein, and the communications both arterial and venous between the vessels of the tympanum and those of the labyrinth in the osseous partitions between the middle and internal ear (Politzer); (d) the connexion thus established (in disturbing conditions of the circulation more especially) between the internal carotid, external carotid, and vertebral vessels; a connexion of still greater importance pathologically when we remember the large size of the tympanic capillaries and possibly (Prussak) the direct passage of arteries into veins without any capillary intervention, while such a vascular link of communication being maintained in osseous structures must, in varying conditions of arterial or venous tension, whether local in the vessels of the tympanum or labyrinth, or general through cardiac or other causes, peculiarly affect the blood-pressure, both in the tympanum and the labyrinth. Professor Politzer, to whom we are more especially indebted for the knowledge of these anatomical facts, says, "From pathological and clinical observations, there can be no

doubt but that hyperæmia and congestion of the vessels of the middle ear accompanied with inflammation owing to these anastomoses, sometimes extend to the vascular regions of the labyrinth causing there temporary or permanent disturbances of nutrition”<sup>1</sup>; (e) the free distribution of vaso-motor nerves to the arteries supplying both labyrinth and tympanum; (f) (the facts of most interest which the nervous supply teaches in relation to tinnitus are) the connexions of the roots and nuclei of the auditory nerve with the peduncles of the cerebellum, the floor of the fourth ventricle, the medulla oblongata, the contiguity of the auditory nuclei to those of the facial, sixth, and eighth pairs of nerves; the decussation of the fibres of the roots which maintain a connexion between the auditory nerve of one side and the nuclei of the opposite nerve, and with the corresponding side of the cerebellum; the relation of the temporal lobe of the cerebrum (Munk and Ferrier) to the sense of hearing (hearing centre), and the experiments which point to a decussation of the auditory nerve fibres in the brain; the nerve connexions established through the spheno-palatine and otic ganglia of the fifth nerve and its superficial petrosal branches with the sympathetic, facial, and glosso-pharyngeal on the one hand (tympanic plexus), and on the other, those connecting branches of the facial, glosso-pharyngeal and pneumo-gastric with the nerves supplying the Eustachian tube, tensor palati, soft palate, and naso-pharyngeal mucous membrane; while worthy of special notice is the distinct supply of the tensor tympani (fifth nerve) and of the stapedius (facial), the “activity of the former muscle being regulated by reflex action” (Foster); (g) the action of the tensor tympani and stapedius muscles in regulating the degree of pressure on the labyrinthine fluid through the stapes and fenestræ; (h) the healthful action of the tubal muscles (levator and tensor palati) in opening the Eustachian tube during deglutition and in certain acts of phonation, thus securing the normal conditions of equilibration in the tympanic cavity, preventing condensation of the contained air, and in consequence maintaining free ossicular movement and the necessary and correlative response of the membrana tympani externally and the membrane of the fenestra rotunda internally, while due equilibrium is sustained in the

<sup>1</sup> Politzer, *Diseases of the Ear* (Cassell), p. 49.

fluid of the labyrinth ; (*i*) the normal mobility of the membrana tympani is essential, not alone for the transmission of the endless variety of vibrations through the ossicles to the perilymph, but this constant correlation of the yielding drum head to the air in the tympanic cavity, and of the movable stapes to the perilymph, is the index to the degree of pressure on the endolymph. Side by side with these anatomical data we may now finally tabulate as the physiological and pathological causes of subjective tinnitus :

1. Interferences with the sound-conducting media in the external and middle ear, viz.:— the air in the meatus, the membrana tympani, the ossicles and ligaments of the tympanum, the air of the cavity of the tympanum, the fenestræ, the air in the Eustachian tube.
2. Interferences with the fluid in the labyrinth.
3. Interferences with the action of the intra-tympanic muscles, or the tubal muscles (increase of tension, rigidity, or relaxation).
4. Reflex disturbances—
  - (a) transmitted to the auditory nerve terminations ;
  - (b) transmitted to the muscles of the tympanum, soft palate, and Eustachian tube ;
  - (c) transmitted to the auditory nerve nuclei.
5. Impulses originated or reflected by the auditory nuclei, the cerebellum, or the hearing centre, and referred to various situations, as the ear or different parts of the head.
6. Irritation in any portion of the auditory nerve tract direct or reflected.
7. Inhibition.
8. Vascular changes, causing alteration of blood pressure or morbid blood supply—
  - (a) Vaso-motor irritation or paralysis.
  - (b) Cardiac diseases.
  - (c) Disorders of the blood, as cholæmia, uræmia, anaemia.
  - (d) Atheromatous arteries.
  - (e) Thrombus or embolus.
9. Hallucinations, the consequence of perverted mental action.

With such an analysis as this before us it is not difficult to realise how the pathological conditions already referred to tend to produce perverted function and disturbance, whether central

or peripheral, in the auditory sensations. It is likewise obvious that our first duty is to differentiate those clinical and pathological causes which are removable and amenable to treatment from those which are outside the physician's art. Yet in this effort lies the first difficulty which meets the aurist. Simple enough in the case of the affections of the external ear, it becomes more difficult when we approach the middle, and still more so when we have to deal with the internal ear or morbid states of the cerebrum or cerebellum. A glance with the speculum will show some abnormality of the external meatus which may account for the tinnitus; this will also demonstrate alterations in the membrana tympani, dulness, rigidity, thickening, thinning, adhesions, bulging, undue prominence of the malleus, and, by the practice of Valsalva's inflation, the degree of mobility. The otoscope will define for us the patency or otherwise of the Eustachian tube, and a little practice and experience will as clearly enable us to differentiate the various responses of the drum head to the inflated air as we educate it to appreciate the changes in the murmurs of respiration conveyed to the ear with the stethoscope. The tuning-fork enables us, in the great majority of cases, to decide how far the nerve is implicated by the middle ear changes, if these be present, or if not, the degree to which the impairment of the nerve has extended, and the power of transmitting sensations is retained, as it also assists us in separating purely middle-ear affections from those having their origin in the auditory sense apparatus in the labyrinth. Politzer's inflation tells us how far temporary restoration of equilibrium in the tympanum, through forcible inflation of air and the consequent effect on the pressure in the labyrinth, removes the symptoms, and assists us in establishing the cause of their presence; the Eustachian catheter further confirms this test. But beyond this, in our first effort to determine the source of the tinnitus, examination of the ear does not in a considerable proportion of cases avail us much in defining and localising its origin. It indicates local conditions and proves local lesions. But then in other instances these may exist without any subjective phenomena. It is possible that the disturbing cause may lie outside these. The nature of the noises does not assist us much. In my notes

I find recorded a great variety of sounds, more commonly those resembling "kettle singing," "trees rustling," "whistling," "birds chirping or singing," "bells ringing," "water rushing," "the noise of a railway engine in letting off steam," "of the waves," "distant voices," "knocking," "rumbling of carriages," "hammering," "rain falling," "dog barking," "a shell before the ear," "bees swarming," &c. I think that the louder the noise and the more defined its character, the more likely are we to find proofs of internal ear trouble. Patients have many times assured me that only with difficulty could they realise the fact that persons were not speaking to them, that some musical instrument was not playing, that it was not raining heavily, or that a storm was not raging. And these noises were not connected with any other mental symptoms or hallucinations. Many times have I been assured that "if only the noises could be cured, the deafness would not signify." And that the tinnitus is a pretty frequent accompaniment of deafness is evident from the fact that it was present in 133 of the 500 private cases recorded. From what has been said it is evident that, failing to determine the cause of the tinnitus by the local examination, or to remove it by inflation, we have to look outside the ear for its explanation. Recurring to the anatomical data we have noted, we would naturally seek in their relative order of importance for the following causes: (a) those operating *in the blood and vessels*, as for example gouty increase of tension, albuminuria, granular kidney, and urine of low specific gravity, diabetes, anaemia, haemorrhages, haemorrhoids, atheromatous states of the arteries, tumours obstructing the circulation, thyroid enlargement, aneurysms, cardiac disease, the administration of toxic drugs; (b) *in the nervous system*: reflex irritations, as in the case of uterine displacements, sexual excesses, dyspeptic conditions with sympathetic disturbances, flatus, irritations of the fifth nerve, either from dental caries or tumours, affections of the naso-pharynx (it is worthy of note that Urbantschitsch and others have found that those "after perceptions," produced by certain noises in persons under thirty, and lasting a given time after the objective source of sound, and to which he gave the name "positive after-images," have what he has called "subjective fields of hearing," and while some of these are situated in the forehead or back of the head, the seat of the "subjective

field" has also been found in the naso-pharynx—Politzer<sup>1)</sup> cerebral inflammations, tumours, degeneration, producing tinnitus either by direct or reflex irritation, or by the disturbance of equilibration in the labyrinth through pressure, disease of the cerebellum, affections of the meninges; (*c*) *general*: mental worry, depression, over-strain, sleeplessness, night nursing, constant railway travelling, especially at night, alcoholism, syphilis, hallucinations associated with mania, dementia, melancholia.

If I cite my individual case it is because I afford a good example of a few well-recognised forms of tinnitus in one in whom the hearing power (at forty) is as yet unusually acute.

A few years since I was alarmed by the occurrence of a bruit, which I distinctly heard shortly after going to bed, and which at times disturbed my rest. I occasionally heard it in the day-time, but very subdued, and only when reading in a quiet room, generally also on awaking in the morning. So closely did it resemble a cardiac bruit that I had my heart examined to satisfy myself that there was nothing wrong with it. Certain things increased its intensity, as night work, alcohol—even the smallest quantity,—tea, strong coffee, any slight attack of indigestion. Changes of temperature, pressure over the mastoid, and more particularly in the hollow space over the stylo-mastoid process, always arrested it; but it seemed after the pressure was relieved to return with increased intensity. The constant arterial "whiz" was most distressing at night, and I grew uneasy lest any aneurysmal condition of a tympanic or other vessel might be present. I tried different drugs, but not persistently, and at last I completely and permanently parted with my troublesome companion in the mountain air of Switzerland. For two years I took no tea, and all coffee was diluted with milk; alcohol I altogether abandoned. In my case anaemia and over mental and bodily strain were the causes. I believe it was a vascular tinnitus from diminished tension. During the time I had periodical intermittent cardiac action. The hearing was

<sup>1</sup> "The pathological relation between congested and hypertrophic conditions of the Schneiderian membrane, and excessive sexual indulgence, is of interest in connexion with this physiological fact. Patients have often expressed to me the fact that the tinnitus was aggravated by frequency of the sexual act, or seminal emissions."

not in the least affected. The noise was especially heard in the left ear. Lying on my left side generally increased it.

About two years since, when perfectly free from any aural disturbance, I was sleeping at a country house, some large trees facing my bed-room windows. I was struck a few mornings by the fact that, though no wind at the time was blowing, I heard a constant rustle of these trees. Finally I found that what I fancied was the noise of the leaves moving was in reality a subjective tinnitus. This has on and off returned to me since. It was induced by naso-pharyngeal congestion and a slight chronic catarrhal state of the Schneiderian membrane. It is much less than it was, and I have relieved myself several times by a nasal alkaline douche. I never find the tinnitus in the day-time, a little at night, but generally more or less in the morning after awaking. Lying on either side increases its intensity in the ear I lie on; pressure on the meatus greatly increases it; practising Valsalva's inflation obliterates it for a short time completely. Alcohol decidedly increases the tinnitus, so does any attack of indigestion. This is a tinnitus associated with altered equilibration in the air of the tympanum through Eustachian collapse or thickening. Exercise decreases the intensity of the sound, so does cold and dry weather; blowing air forcibly through the nares with the mouth shut diminishes the sound, and I have succeeded in obliterating it by the rapid repetition of several such acts. There are a few of these symptoms so common to all those who complain of tinnitus that I may draw attention to them: the arrest of a vascular tinnitus by pressure over, or in front, of the mastoid; the increase of a middle-ear tinnitus by pressure on the ear or closure of the external meatus; the effect of alcohol (likewise of tobacco) in generally increasing all forms of tinnitus; the action of tea and coffee in the same direction; the influence of weather, climate, and temperature, whether the atmosphere be dry and elevated, damp and low lying, moist, cold, or warm. The mode of onset of tinnitus in many instances is also illustrated, the patient fancying that some familiar noise is heard, the subjective sound being projected in the direction from which the sound is supposed to issue; also the complete disappearance of the tinnitus in the day-time, and that even though there be at the time perfect

silence. The effect of mastication in producing subjective tinnitus is noteworthy. Of this I have had several examples.

A curious and interesting case quite recently came under my notice, one which also, I think, establishes the dependence of megrim on labyrinthine disturbance independently of any cerebellar complication. The case was as follows:—

Mrs. W., aged thirty-seven, has for some years suffered from slight deafness, increasing gradually, the hearing distance now reduced to  $\frac{1}{100}$  in the right ear, and  $\frac{3}{100}$  in the left; tinnitus like "steam," "drums," "whistles;" membrana tympani of both ears immobile on inflation; right—rigid, dull, and evident adhesion; left—cone of light still visible, rather concave, malleus prominent; Eustachian tube of both sides closed; the tuning-fork is heard through the bones of the head in the right ear, and louder on closure of the right meatus, whilst closure of the left makes no difference. When partaking of a meal "the first mouthful causes a decided giddiness, and the table appears to go round." The general health is good. Here it would seem as if the first movement of the jaw produced a disturbance of equilibration in the labyrinth, or it may possibly be a reflex central (cerebellar) excitation through the tympanic plexus and auditory nerves. This passes away after eating for a few minutes, only to return with a fresh act of mastication after a prolonged period of rest. I have known several cases where sudden lateral movements of the head have produced tinnitus and giddiness. Most unfavourable are those cases in which we can discover little alteration in the appearance of the membrane, in which we have no evidence of middle ear exudation, and where the sound of the tuning-fork or watch is badly transmitted through the cranial bones, or when closure of the meatus makes no difference in the intensity of the note. So are those cases in which we have proof of old-standing tubal closure and enervation, middle ear ankylosis and adhesions, with noises which have gradually increased until they have perhaps assumed intolerable proportions.

Turning now to the treatment of tinnitus we may broadly say that the indications are (*a*) to restore equilibration in the middle ear and labyrinth; (*b*) to correct abnormal tension (excess or decrease) in the vessels of the tympanum and labyrinth;

(c) to regulate general arterial tension ; (d) to modify and control excess of reflex excitability and morbid central impulses ; (e) to correct local causes of pressure, traction, irritation ; (f) to restore tone to enervated tubal and tympanic muscles ; (g) to promote healthful nasal respiration by attention to the naso-pharynx, and to subdue congestive and inflammatory states of the naso-pharyngeal mucous membrane.

*(To be continued.)*

## Reviews.

*Spinal Deformity in Relation to Obstetrics.* By A. H. FREELAND BARBOUR, M.D., etc. Edinburgh: W. and A. K. Johnston. 1885.

THE author and publisher of this contribution to pathological anatomy deserve great commendation for the manner in which they have done their work. The progress of their subject appears small in comparison to the great labour which it entails, and it unfortunately excites little interest in the mass of the profession in England, who think that the knowledge of a midwife is sufficient for the practice of midwifery. In the common absence of a precise knowledge of the elements of science many fail to appreciate work like this, which has no immediate bearing on their practice; while amongst those engaged specially in obstetric practice there are few whose knowledge of pelvic deformities is sufficient to excite a thirst for more.

The name of Matthews Duncan will ever stand as the first to have placed the mechanics of the pelvis on a scientific footing; since then the names of Fehling, Kehler, Breisky, Litzmann and Leopold, are connected with most of the more recent advances. All investigators, however, including the author of this work, are seriously hampered by the want of a precise basis for the comparison of exact measurements of pelves, which will not be achieved until such work as that which Professor Turner has lately commenced is fully carried out. His paper read before the British Association this summer is the commencement of a comprehensive enquiry into the natural or normal varieties of pelves of various races. Without a knowledge of these data investigators are now constantly meeting with difficulties. The author has adopted Breisky's line as the standard of comparison, and it is certainly to be regretted that there is no more satisfactory basis of comparison yet agreed upon.

The book consists of a series of beautiful plates of kyphotic, kypho-scoliotic and scoliotic pelves, with tables of measurements and descriptive notes; it also contains a series of plates of sec-

tions of a frozen cadaver of a patient with kyphosis who died immediately after delivery.

This work should be in every library and in the hands of all who are interested in the progress of this branch of obstetrics.

*Endemic Goitre or Thyrocele.* By WILLIAM ROBINSON, M.D.  
London : J. & A. Churchill. 1885.

THIS is a thesis for the Durham university degree for which the gold medal was awarded in the year 1884. It is a clear and concise account of our present knowledge on the subject. The practitioner will look and not in vain for most valuable practical information as to the treatment of emergencies when the rapidly growing goitre produces pressure effects of a dangerous character, especially dyspnoea. The entire removal of the thyroid is not advised except in rare cases, for if the patient be young the "cachexia strumipriva," is apt to follow. Moreover there is the immediate risk of collapse of the softened windpipe, to which the enlarged thyroid had hitherto acted as a side-splint ; and on the removal of this support the tracheal cartilages make a fatal kink. Partial is considered preferable to total excision ; division of the enlarged isthmus, or better still removal of the whole of it is advised. "Small tumours often give rise to distressing symptoms," and "the pressure effects bear no proportion to the size of the goitre ;" these important observations are well discussed and have important bearing on the surgical treatment. Dr. Robinson considers that medicinal treatment suffices for the majority of cases, mentioning iodine as especially to be relied upon, and to be used both externally and internally. Good results are said to have followed the exhibition of quinine. We can recommend this book as containing information on the subject of goitre not to be obtained from the ordinary textbooks.

*Die Actiologie der chronischen Lungenschwindsucht (The Aetiology of Chronic Pulmonary Consumption).* By DR. HERMANN BREHMER, Senior. Berlin : Hirschwald. 1885.

DR. BREHMER being at the same time the founder, the proprietor, and the principal physician of a large establishment for the treatment of consumption at Görbersdorf, in Silesia, possesses the advantage of great experience ; his views, therefore, deserve the attention of the profession. We will first summarise them, and then survey the arguments by which he supports them. He is a strong anti-contagionist and anti-infectionist ; he does not altogether deny the importance of the tubercle-bacillus in the pathology of tuberculous consumption, but he does not accept the view that the bacillus enters the body through the air which the patient inhales ; he is inclined

to assume that the bacillus is developed within the body. He acknowledges the influence of heredity, but in the sense that certain morphological changes are by unfavourable circumstances gradually established in the parents, transmitted to the offspring, and by untoward agencies further developed in the latter. The main morphological defects are, according to him, a small heart and proportionally large lungs, the small heart not being able to nourish the large lungs.

Dr. Brehmer first discusses some points of the history of the infectiousness of consumption. He does not quite deny that tuberculosis may be communicated by feeding animals with tuberculous matter, but he maintains that this can only be of very rare occurrence in man, and that in this way "*primary pulmonary phthisis*" can never be produced. The experiments with inhalation of pulverised tuberculous substances have not proved to his mind the communicability of phthisis in this manner. Koch's experiments, he maintains, prove only that miliary tuberculosis can be produced by inoculation, not caseous pneumonia; that, therefore, in addition to the bacillus, other circumstances are required to produce caseous pneumonia and chronic phthisis. The author is very strict in his demands with regard to the views and inferences of others. "In natural science," he says, "the principle to be maintained is that as causes of certain phenomena only such influences can be acknowledged which, with the exclusion of all other factors, always and invariably reproduce the same phenomena. This principle is to be maintained in medicine" (p. 51). We are not perfectly sure that Dr. Brehmer has applied this test to his own views and inferences, or that they can stand this test.

The author regards scrofulosis as entirely different from tuberculosis, and as totally independent of the bacillus. The bacillus is not found, he says, in all scrofulous glands; "hence it can have no share at all in the production of scrofulous affections" (p. 54). It is difficult to accept this mode of reasoning.

He discusses largely the difficult question of heredity, and objects to the view of the transmission of the latent disease itself, or of the tubercle-bacillus. He is also not in favour of the existence of the predisposing causes usually mentioned, and regards the so-called "paralytic thorax" as the only tangible peculiarity, which, however, is frequently not inherited, but acquired. This form of thorax is, according to the author, associated with a too small heart and too voluminous lungs; and Rokitansky is quoted in support of this statement. It appears to us, however, very difficult to prove that in the paralytic thorax the lungs are too large and the heart too small before tuberculous disease has established itself. How rarely

does the opportunity of a post-mortem inspection offer itself before the lungs are diseased, and when death from consumption has occurred the comparatively large bulk of the lungs is made up partly by cavities and infiltrations, partly by emphysema and other morbid processes. The size of the heart after death from chronic phthisis is mostly small from atrophy, as it is in other forms of wasting disease. Rokitansky distinguishes in the paragraph on abnormal smallness of the heart two forms of smallness : (1) the congenital or original, and (2) the acquired or atrophic form. The first, he says, occurs principally in females, and is mostly associated with general arrest of development, especially of the sexual organs. The second, or atrophy of the heart, accompanies wasting diseases, such as typhoid fever, the wasting stages of tuberculous phthisis, cancer, chronic suppuration, etc.<sup>1</sup> Brehmer, we must add, does not accept this interpretation, and states that Rokitansky in a letter to him concedes that he acknowledges original smallness of the heart. We therefore give the reference to Rokitansky's book in order that the reader may judge for himself. The argument based on the insufficiency of the small heart in proportion to the too large lungs, and the resulting imperfect nutrition of the lungs, suffers from the circumstance that the size of both organs has been ascertained only after death from chronic phthisis, not before the commencement of the disease.

We do not wish to say that the size, and still more the power, of the heart may not be reduced before the actual development of phthisis; on the contrary, they probably are so, for mal-nutrition of the whole body, and not least of the heart and lungs, is known to us to precede for a longer or shorter period the development of chronic phthisis. This view is, however, older than the nineteenth century.

Dr. Brehmer then endeavours to establish his views regarding the aetiology of phthisis by a large number of cases selected from the 12,000 patients who have passed through his establishment. He blames the profession that they do not sufficiently apply the Darwinian doctrine to the interpretation of pathological conditions. Thus he says that medical men speak of hereditary predisposition only when phthisis exists, or has existed, in the families of either of the parents, overlooking that the disposition may be gradually developed and transmitted without manifesting itself in the parents as actual consumption. The first series of 100 cases include patients whose parents and grandparents were free from phthisis and longlived, yet in the third generation phthisis appears. All the patients of this series have, according to the author, this in common, that they are amongst the youngest of large families of children; and the

<sup>1</sup> Rokitansky, *Lehrbuch der pathol. Anatomic*, third edit. vol. ii. p. 262, 1856.

majority of them had never been great eaters, and had suffered from palpitation of the heart during the period of sexual development. We cannot say that these cases are in any way convincing. We all know, and our forefathers knew before us, that mothers who are not very strong are weakened by the rapid succession of many pregnancies and confinements, especially if they nurse the children; that the weakening effect shows itself as well in the health of the mother as in that of the children; and that the latter become predisposed not only to phthisis, but also, and quite as much, to scrofula (which the author declares to be different from tuberculosis), to rickets, to rheumatic arthritis, to eczema, to arrest, or other anomalies of development, bodily as well as mental. Brehmer is certainly not justified in assuming that medical men do not pay attention to this fact. On the other hand, healthy parents often have many children who all are robust, if the intervals between the pregnancies are not too short; and this, as we have many instances to prove, may repeat itself during two and three and more generations, without producing any predisposition to phthisis. We may further ask: Is phthisis less frequent in countries where small families of two to four children are the rule?

The next series of 100 cases contains patients whose *parents*, though apparently healthy, were amongst the youngest children of large families, the patients themselves having mostly been poor eaters, and having suffered from palpitation of the heart. The same remarks which we have made on the first series apply to the second. The thousand different influences which have acted on the patient himself and thus *produced* the disposition are not mentioned, and the inheritance of phthisis is in most cases not patent.

The third series contains cases which are of somewhat similar origin as those of the first and second series, excepting that phthisis in adult age had been preceded by serofullosis in childhood.

Then follows a chapter (VI.) with 100 cases of phthisis from acknowledged hereditary predisposition, *i.e.* where phthisis existed in either of the parents. In the seventh chapter he discusses cases of phthisis originated by other causes. Most of them have this in common, that the interval between the birth of the consumptive patients and that of the preceding children was only one year; and that the patients themselves were poor eaters. A few of the cases originated in injury to the walls of the chest, without fracture of ribs, causing pneumonia by concussion, which may pass into actual phthisis, as Lebert has shown in his *Traité de la Phthisie pulmonaire* (1879).

In the next chapter the author endeavours to show an inti-

mate relation between phthisis and insanity and epilepsy. We fail, however, to recognise any nearer relationship than that generally acknowledged, viz. that mental derangements and epilepsy are frequently produced by various forms of chronic and acute malnutrition of the entire body, and consequent changes in the cerebral circulation and nutrition. We need only point to the well-known forms of the delirium from collapse, and of insanity consequent on acute diseases; the peculiar hebetude of the mind manifesting itself by no means rarely in consequence of acute and chronic diseases of different kinds; epilepsy after typhoid fever, to which Dr. J. W. Ogle has directed special attention; the proverbial irritability of temper in sick and convalescent children, in gouty and in dyspeptic patients.

In the ninth chapter the author points out the slow development of phthisis as different from the sudden development of common acute infectious diseases, and regards this fact of slow development as opposed to the bacillus theory. This argument does not convince us, and we must, besides, not forget that even in our temperate climates phthisis not rarely runs an almost acute course, and still more so in hot climates. Brehmer further points to the frequent occurrence of a history of palpitation of the heart during the period of sexual development, and explains this by the imperfect development (the smallness) of the hearts in those disposed to phthisis. He has to confess that some phthisical patients say that they have never suffered from palpitation, but this denial does not influence our author, and does not prevent his assuming that they have suffered from palpitation without knowing it or that they have forgotten it. Congenital smallness or imperfect development of the heart belongs to phthisis, and the theory demands that palpitation must occur during the period of sexual development when the heart grows rapidly. Smallness of the lungs, on the other hand, produces immunity from phthisis, says our author. We are not sure, however, whether he has as yet established this as a law of natural history.

We have already mentioned that the author is strongly opposed to the view that phthisis is communicable or infectious, or that it is caused by inhalation. He goes so far as to say that it is to be considered as an established fact that phthisis is *not* a disease of inhalation. As, however, he cannot deny that the bacillus plays an active part in the destructive progress of the disease, he adopts the view of Wigand that bacteria originate spontaneously and independently of pre-existing spores in organic substances, and thinks, for instance, that the rapid development of phthisis from a traumatic cause, such as a blow on the chest, is to be explained in this way. He has

himself seen cases of sporadic typhoid fever in isolated localities, which developed themselves under the influence of grief, and could, he says, not be explained by importation of the germs. In the same way he explains the development of tubercle-bacteria in cells which are lowered in vitality and are in a condition of decay. We cannot see the force of the author's arguments, ingenious as they are. He has not proved that phthisis is never caused by inhalation, nor that it cannot be communicated, nor that his cases of typhoid fever originated without the introduction of spores into the system, nor that tubercle-bacteria develop themselves in the cells of the body without having been introduced from without.

It will be clear from our criticism that we think Dr. Brehmer's paternal fondness for his theory has warped the conclusions he has drawn from the large amount of clinical material at his disposal.

## Clinic of the Month.

**Cold-sponging in Pneumonia.**—Mr. Sterling Back, of Bromley, gives the following case. On the evening of Sunday, May 31st, 1885, I was sent for to see E. L——, a robust male aged thirty-five years. I was informed that he had been “ailing for a week or more”; but the evening previous to my being sent for he was seized with severe shivering, pain in the side, and shortness of breath. On examination, I found all the usual symptoms of acute double basic pneumonia. Temperature 104° F.; pulse 120; respiration 48. I ordered jacket poultices of linseed meal to be applied every four hours. I also ordered him a mixture containing five minimis of tincture of aconite, half a drachm of antimonial wine, and five minimis of ipecacuanha wine in each dose, every four hours; a diet of milk and beef-tea to be given frequently, and ice to suck. On June 1st the symptoms remained much the same.—2nd: I was sent for hurriedly by a message that the “patient was dying.” I found him very delirious and suffering with profuse diarrhoea, passing his motions and urine involuntarily. Respiration 60; temperature 106°; pulse 140. I ordered a mixture containing forty grains of aromatic chalk powder to a dose, every two hours for the diarrhoea; and a mixture containing five grains of carbonate of ammonium and an ounce of the decoction of cinchona every three hours. He was given small quantities of good veal broth, alternating with milk frequently, an ounce of brandy every two hours, and ice to suck.—3rd: I found the patient worse. Temperature 106°; pulse 140, very weak; respiration 80. The diarrhoea had ceased, but he was still very delirious. Seeing that the patient would rapidly die unless something else were done, I ordered the back and front of the chest to be sponged every hour with cold water, continuing the brandy and nourishment as before, and gave him an expectorant mixture, containing five minimis of ipecacuanha wine and ten minimis of tincture of squills in each dose, every four hours.—4th: I found a marked improvement. The temperature had fallen to 103°; pulse 120; respiration about 40. Delirium much less, at times breaking

out. Treatment continued.—5th: Much improved. Quite conscious, but very exhausted. Temperature 100°; pulse 110; much stronger; respiration 34. Treatment continued.—6th: Improvement continuing. Temperature 99°; pulse 100; respiration 30. Cold sponging now ordered only twice a day. Brandy and nourishment continued.—7th: Temperature normal; pulse rapid and rather weak, 100; respiration about 25. Treatment continued excepting the cold sponging, which I ordered to be discontinued.—14th: Patient now convalescent; is out of bed for a short time to-day. Temperature normal; pulse 90; stronger; respiration nearly normal. Has a cough. I ordered a mixture of ten minimis of dilute sulphuric acid, five minimis of ipecacuanha wine, ten minimis of compound tincture of camphor, one drachm of syrup of red poppies, in water, every three or four hours.—25th: Patient progressing well. Has been out of doors. Cough much better. On July 1st the patient went away for change of air. On the 27th he returned home and called upon me, and appeared to be quite well. An examination of his chest revealed nothing, and the breath-sounds were good.

*Remarks.*—Cold sponging of the chest in acute pneumonia is recommended to be used with very great care, or passed over altogether, in many of the text-books on the subject, I believe. This is the first case in which I have ever cared to use it in such an instance; but as I could plainly see that on June 3rd he was rapidly dying, and taking into consideration his high temperature and rapid pulse, I determined to do it, with the above happy result. I may add that his brother-in-law, who was most careful in carrying out my orders, was most instrumental in effecting his recovery. (*Lancet*, Aug. 29, 1885.)

**Respiratory Croaking of Babies.**—Dr. Samuel Gee has seen about a dozen cases of what he calls respiratory croaking in babies, and thus describes the affection. Breathing is accompanied by a croaking noise, which seemed to Dr. Gee to have the characters of stertor more than of stridor; or, in other words, the sound seemed to be produced in the fauces and not in the larynx. The croaking usually accompanies inspiration only, but in one of the cases it accompanied expiration only. The noise is constant, both when the child is awake and when she is asleep; yet it may cease for a short time now and then. The tone of the cry is natural, and this is another reason for believing the noise not to be laryngeal. No dyspnoea, no recession of chest wall during inspiration. Fauces look natural. The noise continues when the nose is pinched. The croaking has nothing whatever to do with the crowing of laryngismus stridulus; the two disorders resemble each other in no respect, except that there is a noise produced in each. The ages of Dr. Gee's patients

ranged from three to nine months. It is a remarkable fact that all of them were girls. The general health of some of the children was good, but most of them were weak and sickly. Two children suffered from congenital diseases of the heart, and one was an idiot. In some of the children this croaking began at or soon after birth, and in no case did it last much beyond the end of the first year. There is no special treatment; indeed, the disorder causes more annoyance to others than to the child herself. Joseph Frank, in his "Praxis Medica" (De Morbis Laryngis, cap. ii., sect. 11), refers to observations of Storch which somewhat resemble these. But most of Storch's patients were older than Dr. Gee's, and he seems to have confused all kinds of stertor and stridor together. There is a much better description of the disorder in Rilliet and Barthez' book, "Des Maladies des Enfants," under the name of "Trachéite de la Première Enfance," but Dr. Gee's description, he says in conclusion, is wholly upon facts within his own experience. (*St. Barth. Hospital Report*, 1884.)

**Strychnia in Acute Alcoholism.**—Dr. Lardier has long employed strychnia in the treatment of delirium tremens, and regards it as the best remedy which we possess for this condition, as, in fact, a veritable specific. He insists upon the necessity of giving the drug in large doses. In one case he had given granules containing each  $\frac{1}{3}$  grain every two hours for several days without any appreciable result. He then increased the number of granules and also administered the drug hypodermically, giving in all  $1\frac{2}{3}$  grain in the space of twenty-three hours. The result was a most happy one. The patient soon fell into a refreshing sleep, never exhibiting the slightest symptom of strychnia poisoning. (*Journal de Médecine et de Chirurgie Pratiques*, June 1885.)

**Fatty Diarrhœa.**—Dr. Tscherhoff has made a large number of analyses of the stools of healthy and diseased infants. The fat in seven healthy children under six months old amounted to from 25 to 30 per cent. of the dried faeces. The average quantity in four dyspeptic children was 48 per cent. Two infants with erysipelas showed respectively 44 and 52 per cent., and the amount remained high long after their recovery. Two cases of catarrhal pneumonia gave 51 per cent. each, and another case 60 per cent. A child with bronchitis and nearly normal temperature showed 39 per cent.; another with chronic diarrhœa 42 per cent. A child nine months old showed during an attack of scarlatina 57 per cent., and after recovery only 32 per cent. The next case was remarkable, for the stools, which were frequent, offensive, and whitish, contained, when dried, no less than 75 per cent. of fatty matter; the child, aged two months, was icteric, with greatly enlarged liver and spleen. A wasted child

six months old, nursed by its mother, had diarrhoea, with slimy blood-stained, offensive stools, which showed 50 per cent. of fat. After treatment, including the substitution of a wet-nurse, the child recovered, and regained all its flesh, but the dried stools still showed 40 per cent. of fat. This case exemplifies the difficulty with which children regain their power of assimilating fat. In the experience of the author, every disturbance of the digestive tract is accompanied by increased fat in the stools, and this increase is greater still if the temperature is raised. Even adults, when feverish, show an increase of 14 per cent. The quantity of fat in the food does not seem to affect the proportion in the stools. (*London Medical Record*, June 15, 1885.)

**The Chin Reflex.**—In the winter of 1882, while examining, at the Infirmary for Nervous Diseases connected with the Orthopaedic Hospital, Philadelphia, a case of section of the inferior dental nerve, Dr. Morris J. Lewis discovered a new reflex. [For report of case see *Philadel. Med. News*, March 11, 1882.] This consists of a sudden elevation of the lower jaw immediately following a blow upon the lower teeth, or chin, and is most easily produced by striking the parts mentioned in a downward direction with a rubber plexor. The mouth of the patient is of necessity open, and the muscles should be relaxed. Since then he has observed this symptom in two cases of spastic paralysis, one case of congestion of the spinal cord, one of cerebral tumour, probably specific, one of hemiplegia, one of unilateral tumour of doubtful origin, and occasionally in perfectly healthy individuals. In some of these the reflex was plainly due to a contraction of the temporal muscles, while in others the masseters seemed to be mainly instrumental in causing it. The clinical significance of this symptom is not as yet clear, but Dr. Lewis wishes to place it upon record, and to direct attention to it, hoping later to be able to report more fully. Gowers, in his "Diseases of the Spinal Cord," mentions that irritation of the skin in the interscapular region gives us the highest reflex available; the *chin reflex* is, therefore, of considerable interest, as being, as far as Dr. Lewis is aware, *the highest deep reflex yet discovered*. (*The Polyclinic*, June 15, 1885.)

**Congenital Absence of the Right Kidney.**—Dr. Hofacker reports a case of congenital absence of the right kidney. The case is as follows: A post-mortem was held on a child eight years of age, who had died of caries of the ilium and sacrum. The right kidney having been discovered to be absent, attention was drawn to the unusual development of the left kidney. This was nearly five inches in length and nearly three inches broad, double the size corresponding to the age and development of the child. Upon the right side no trace of a

kidney was to be discovered. To the left kidney a large renal artery proceeded, while on the right side no trace of this vessel existed, the aorta at the ordinary point of origin of the vessel being perfectly smooth; the right renal vein was also absent. In the bladder there was no opening corresponding to the entrance of the right ureter, but only a slight depression by which the trigone of the bladder was preserved. From the outer wall of the bladder it was possible to trace through the retroperitoneal connective tissue a cord which in one place permitted the entrance of a bristle and lost itself in the region corresponding to the normal location of the right kidney. This, without doubt, represented an undeveloped ureter. The vasa deferentia were normal. The seminal vesicle on the right side was rudimentary and smaller than that of the left. The right testicle was absent. The bifurcation of the aorta was normal, and other abnormalities in the development of the different organs were not discoverable. (*Deutsche med. Wochenschr.*, July 23, 1885.)

**Nasal Polypi and Epilepsy.**—To the cases already cited of different forms of reflex epilepsy cured by removal of the exciting cause, the following one of Fineke may be added (*Moniteur de la Polyclinique*, June 7, 1885). A man, sixty-four years of age, was suddenly seized with numerous and repeated attacks of epilepsy, for which no other possible cause could be found than obstruction of the right nasal fossa by a mass of polypi resembling a bunch of grapes. These polypi were extirpated, and the convulsive attacks at once ceased, and had not returned at the time of the report, two years after the operation. (*New York Med. Record*.)

**Periodic Paralysis of Limbs, with Loss of Electric Excitability.**—A remarkable case of periodical paralysis of all the extremities is recorded in a paper by Professor Westphal, *Berliner klinische Wochenschrift*, Nos. 31 and 32, 1885. The patient, a boy of twelve years, was under close observation for several months, during which he was subject to occasional attacks of absolute loss of power in the limbs, coming on almost always at night, lasting for a few hours, and disappearing with a period of quiet sleep before the morning. His general health was good, and no signs of nervous disease could be traced in the case. During the periods of paralysis, however, the remarkable fact was observed that the nerve trunks and the individual muscles in the affected limbs had completely lost their electric excitability even under the irritation of a very strong current. At other times, the reactions were quite normal, but slight differences between the two sides persisted for some time after the complete return of voluntary movement. There was no sign of rigidity or contraction in any of the muscles during the attacks, nor was the

general sensation disturbed. The plantar reflex was absent, but the cremaster and abdominal reflexes and the knee-jerk were normal. The latter was at times unequal upon the two sides. The fullest particulars of each seizure are given in detail in Dr. Westphal's paper. The progress of the paralysis of the limbs could be clearly described by the patient, who remained quite sensible throughout. In the early history of the case, there was reason to believe that scarlatinal nephritis had formerly been present, but the renal and all other functions remained normal throughout the period during which the patient was under observation. The onset of the attacks was attributed to exposure to a draught, the boy having complained the day before of indefinite sensations in the limbs, and pains in the feet. He became quite powerless in the following night, and suffered from great thirst, a feeling of extreme heat, and profuse sweating. At first the attacks of paralysis recurred at intervals of four to six weeks, but became more frequent, at last sometimes appearing many times in one week. In his remarks upon the case, Professor Westphal cites three other published cases as bearing some relation to this apparently unique form of paralysis. In all of them there were points of resemblance to it, although none could be said to be identical. Especially with regard to the periods of recurrence, there was a marked difference, as in two of them the attacks followed a regular quotidian or tertian course. In all the cases the paralysis began in the lower extremities. The muscles of the face and of the eye remained unaffected in all, nor was any affection of bladder or rectum observed. The loss of electric contractility and its rapid recovery are conditions apparently quite peculiar to Westphal's case. In relation to it he says: "We know of no disease either of the spinal cord or of the spinal nerves in which anything similar to it has ever before been observed; and as regards any explanation of it, physiology leaves us completely in the dark." The sensations of heat and the extreme sweating experienced by the patient suggest the possibility of some profound alteration of the vascular supply, and hence of the nutrition of peripheral nerve endings, but such an explanation is of necessity purely conjectural. (*Medical Times*, Aug. 29, 1885.)

**Santonin in Amenorrhœa.**—Mr. Walter Whitehead of Manchester writes: At the risk of being regarded premature, I wish to attract early attention to the therapeutic value of santonin in the treatment of some forms of amenorrhœa, especially when associated with chloro-anæmia. Some years ago, during my attendance upon a young lady of seventeen, suffering from an obstinate ingrowth of a toe-nail, it was incidentally mentioned that the patient had symptoms suggestive of worms. I prescribed

ten-grain doses of santonin to be taken for two consecutive nights, and to be followed each morning by a seidlitz powder. No worms, however, made their appearance, but a few days afterwards I was casually told that menstruation, which had been in abeyance for several months, had again taken place, and in a much more healthy manner than formerly. The coincidence did not impress me at the time, and I never for a moment supposed that the reappearance of the catamenia had the most remote connexion with the two doses of santonin. The subject did not cross my mind again till upwards of twelve months afterwards, when one day, whilst prescribing for a young girl suffering from ozæna, I was forcibly struck with her chloro-anæmic appearance. Influenced by some impulse—"the association of ideas" I suppose—I ordered santonin in the same manner and in the same doses as in the previous case, and, much to my surprise I must confess, with the same results. I have frequently since administered santonin in amenorrhœa with almost universal success, and in many cases after the ordinary remedies, including the permanganate of potash, have been tried in vain. I must admit that I have not had an opportunity in any of my cases to investigate the concurrent uterine pathological condition. I have simply given the drug empirically to all patients who have come under my notice suffering from amenorrhœa, with expectant uncertainty. My immediate object is to submit my brief experience to the profession in the hope that the experience of others may shortly test the potent or valueless influence of the drug in this particular derangement. One of my cases is, perhaps, worth brief mention, as illustrating in a marked degree the class of cases so frequently brought under professional observation, and one that has received remarkable benefit from the drug. The patient was a young lady sixteen years of age. She was the daughter of an elderly drunken father, and she had a rheumatic mother. I saw her first when suffering from symptoms which, at the time were attributed to ulceration of the stomach, fixed pain, anorexia, rejection of food, general physical prostration, and lassitude. She had alarming attacks of prolonged faintness, shortness of breath upon the slightest exertion, and obstinate constipation. Her expression was characteristically that of chloro-anæmia, and she was emaciated to the last degree. Confinement to bed, and nutritive enemata, exclusively used for alimentation for two months, restored the digestive organs to the tolerance of simple food; santonin promptly corrected the menstrual functions, and at the same time appeared like magic to restore the patient to robust health. Ever since any omission of the period has been immediately rectified by a single dose of santonin. In cases of chloro-anæmia, subordinate to amenorrhœa, the drug appears to

be of the most signal value, as I have invariably noticed that with the return of menstruation, or a discharge of blood from the vagina equivalent in effect, every symptom has rapidly subsided. The mere discharge of blood immediately following the administration of the drug will not, I suppose, be accepted by some as normal menstruation, but as a fictitious substitute; it must, however, be admitted that the practical value is established when the discharge, be it vicarious or otherwise, is followed by the amelioration of the chloro-anæmia, which in reality constitutes the pressing ailment we have to contend with, rather than the mere absence of menstruation. Whether santonin or any other drug is in a true sense a genuine emmenagogue is very doubtful, for if we regard menstruation as coincident with ovulation, and ovulation the periodic rupture of a Graafian follicle, we cannot expect the ovaries to assume this complex physiological process of definite periodic rotation at will; nevertheless, if a single dose of santonin will immediately produce the apparently normal performance of the function, together with other consensual phenomena, when they have been dormant for several months, it is entitled to some further distinction in our Pharmacopœia than that of being simply a vermifuge. It would be necessary to accept a theory that ovulation could at a certain stage be temporarily suspended, and capable of being immediately accelerated under the influence of certain induced conditions, before we could acknowledge the action of santonin as a true emmenagogue. (*Lancet*, Sept. 6, 1885.)

**Cocaine in Sea-sickness.**—In a preliminary report on some observations upon hydrochlorate of cocaine, Dr. Manasseïn, of St. Petersburg, gives an interesting account of the employment of the drug in sea-sickness. He had read of its value in uncontrollable vomiting of pregnancy, and thought it might be useful in sea-sickness. He therefore went this summer on a sea voyage in order to test its efficacy. Among his fellow passengers were two, a man and woman, who were especially prone to the malady. He administered to each of them every two or three hours a teaspoonful of the following solution: hydrochlorate of cocaine (0·15), rectified spirits of wine (in sufficient quantity), and distilled water (150·0), beginning the administration on starting. That it had a prophylactic effect seemed clear, for in spite of very rough weather for a period of forty-eight hours, both the individuals were for the first time in their lives free from sickness, and enjoyed a very good appetite the whole time. To a child six years old, who began to be attacked with sea-sickness on rising in the morning, the treatment was so effectual that it was able to play about during the day in spite of the storm. The child took one teaspoonful in

two doses during the first half-hour, and then half a teaspoonful every three hours. Another case was that of a girl, eighteen years of age, who had been sick for twenty-four hours before the drug was given. The case being a severe one, she had a double dose every half-hour, with "truly magical effect," for after the second dose the patient was able to assume a half-sitting posture, and after the sixth dose she jested and began to complain of hunger. During the rest of the voyage she remained well, although there was much rolling of the vessel. Similar good results attended the use of the drug in three milder cases; and had it not been that his supply ran short Dr. Manassein would have been able to make more extended observations. Still, from the experience of these few cases he thinks it justifiable to infer that in the drug we have a certain and harmless remedy against seasickness. In the same communication he mentions that he had found hydrochlorate of cocaine of great service in arresting the collapse of two severe cases of simple cholera, and thinks it desirable to try its action in cases of Asiatic cholera. (*Berl. klin. Woch.* Aug. 31, 1885; *Lancet.*)

**Aphasia from Mental Blindness.**—Of the forms of aphasia taken in its widest sense two may be said to fall under the head of incapacity of transmission, and two under the head of incapacity of reception. The first two are motor, viz., the incapacities of putting into sounds the words which can be imagined, or of putting into written shape the word which can be spoken (agraphia); the second two are sensory, viz., the incapacity of getting any idea of a word from either ear or eye, from sound or sight, mental deafness and mental blindness to words. Ribot has helped to show that there is not a memory for words *per se*, but a memory which is with some people visual and with others auditory; some in remembering a word recall its written or printed look, and some its spoken sound. Prof. Bernheim gives in detail the account of a case of partial aphasia lasting over a long time, in which there was another and more special element, viz., no physical blindness but a mental incapacity to recognise from sight, at any rate, what things were (*cécité psychique des choses*). It was in a man aged sixty-three, of healthy antecedents. In May, 1883, he had some hidden cerebral symptoms followed very soon by incomplete left hemiplegia (with slight primary contraction passing off in a few days), left hemianesthesia and hemianalgesia and left lateral hemianopia of both eyes. During the next two years, up to the time of the report, slight loss of power on the left side continued, with the hemianopia as before, and occasional attacks of Jacksonian epilepsy intervened. A few months before the onset of his cerebral symptoms a small tumour had been

removed from his eyelid, and it seemed at first probable that his brain injury was due to a similar tumour in it; but the almost completely stationary character of his state during the next two years rendered this ultimately very unlikely. That the internal capsule must have escaped serious injury was to be gathered from the rapidity with which he recovered from the hemianæsthesia and the slight early contraction and exaggeration of reflexes. He was a left-handed man in all actions except writing which he had been obliged to learn with his right hand, and which he could still execute after his brain symptoms were developed. But he could not read what he wrote, nor any print, nor could he recognise more than one or two out of many drawings of simple objects. He could add and multiply, and recite the days of the week and the months of the year, and keep up a conversation which was in most points natural enough, but when he was shown simple objects it became obvious that he did not recognise them; a glass he said was a bar, a loaf was a saltcellar, a book was crust for a pie, a crucifix was a catechism, and so on; a knife he would recognise one week and the next he would say it was a key to make soap. And that this was due to want of recognition, not merely the result of inability to use the right names, he would show by his actions. He was asked what a bunch of keys was, and he said at once that it was used to make marks with, and he took a key and made motions with it as if it had been a pen; then he saw or felt that that was not its right purpose and was puzzled and tried to sow corn with it as he said he had done thousands of times before, but was again dissatisfied. Bernheim made the motion of opening a lock, but he gained no information from that; then he asked him, "What do you use to unlock a door?" and at last he caught the auditory suggestion and said, "A key, of course; this is a key." Bernheim conceives a centre of visual memory in the inferior parietal lobe, and a centre of auditory memory in the first temporo-sphenoidal convolution, interconnected by at least two paths, and connected each more intimately with a centre of simple vision and a centre of simple hearing (*audition brute*). In the patient under discussion it is to be imagined that the normally intimate connexion of the visual memory with the centre of simple vision was nearly gone, and that the visual memory could as a rule only be reached after considerable difficulty by a path which was unusual in this particular subject, viz., through the hearing and the auditory memory. The verbal amnesia arose, in fact, from a mental incapacity to recognise things in general by sight, and this suggests that probably there are also cases in which there is a similar incapacity to recognise things in general by hearing which leads to a similar verbal amnesia. (*Révue de Médecine*, Aug. 1885.)

**Over-feeding in Phthisis.**—Urged by the recommendations of Debove in its favour, Peiper has made trial of this method of treatment in fourteen cases, the results of which he now records. The food which Debove used consisted of milk with eggs beaten up in it and powdered beef, the latter being obtained by carefully drying pieces of beef over a gentle heat and then powdering it up in a mortar. It is well borne and easily digested. In those cases in which there were want of appetite and disinclination for food he was accustomed to introduce the food through the stomach tube, overcoming the vomiting which sometimes occurred by previously washing out the stomach with ice-cold water. This method, as might be expected, was not always successful, and, in the two cases in which Peiper adopted it, caused such vomiting and general disturbance, and created such an invincible repugnance to its repetition that he was obliged to desist altogether from it. He therefore administered the food to them in the natural way, preferring rather to combat their want of appetite and overcome their disinclination for food by the use of stomachics and other suitable remedies. Half a litre of milk containing four or five eggs and twenty-five grammes of this powdered beef was given twice a day, forenoon and afternoon, the quantity of the powder being increased by twenty-five grammes every two or three days, till the amount given was so great as 200 to 300 grammes distributed over three or four periods of the day. The patient received in addition as much other food, vegetables, etc., as he could take, and other auxiliaries to the cure were employed, e.g. the administration of cod-liver oil, the use of turpentine and eucalyptus oil inhalations and plenty of fresh air. The results obtained he claims to be very satisfactory, although in the presence of the other means of treatment employed how far these are to be ascribed to the over-feeding is a question to which various answers may be given, although, in anticipation of such an objection, he states that the method by over-feeding was only commenced after the usual remedies had been tried for months without avail. Improvement soon set in, appetite was increased, diarrhoea was stopped, and cough and expectoration relieved and diminished. A good effect on the fever and the night sweats could only be observed in a few cases. (*D. Arch. f. klin. Med.*, Aug. 27, 1885.)

## Extracts from British and Foreign Journals.

**Terpine in Phthisis.**—The unsatisfactory state of the treatment of phthisis and the position of M. Germain Séé as a practical physician may be regarded as sufficient reasons for a reopening of the investigation of terpine as a therapeutical agent. A careful account of M. Séé's study of the subject may be perused in the *Bulletin de l'Académie de Médecine*, No. 30. Terpine is believed to be a powerful agent in modifying the respiratory mucous membrane, and in diminishing morbid secretions. It is said to diminish, and even to cause to disappear altogether, the purulent secretion of catarrhal forms of phthisis. The muco-purulent secretion that proceeds from the bronchial tubes irritated by tubercles and that which comes from the walls of pulmonary cavities are the indications for the use of terpine whenever these secretions are sufficiently abundant to exhaust the patient. Terpine is useful in the haemoptysis of incipient tuberculosis—that is, before the development of cavities with aneurisms in their walls. In the treatment of catarrhal pneumonia and chronic bronchitis, independent of asthma, that only induce dyspnoea by plugging of bronchi, terpine constitutes the best means of lessening the bronchial over-secretion. Its prompt action and freedom from disagreeable physiological effects ought to make it a preferable preparation to those containing impure forms of turpentine. On account of its perfect harmlessness and easy digestibility it has advantages over creasote. The best method of administration is in the form of a pill, or as an aleoholic preparation; the most convenient dose is one gramme. In nervous asthma, whether emphysematous or catarrhal, iodine and pyridine are incomparably superior to terpine. Terpine is a derivative of turpentine; it is the binhydrate of turpentine, and may be represented by the following formula:  $C_{20}H_{16}(H_2O_2) + 2(H_2O)$ . It is formed by the direct union of its component elements when turpentine is allowed to remain in contact with water. (*Lancet*, Sept. 5, 1885.)

**Massive Doses of Digitalis in Lobar Pneumonia.**—In the hands of M. Petrescu, Professor of Therapeutics at Bucharest,

the dosage of digitalis has been carried far beyond the limits formerly recognised. The disease under treatment was lobar pneumonia occurring in one lung or in both, in some cases uncomplicated, in others associated with pleurisy. Some of the cases do not seem to have been severe from the first, the majority however, were so. They were taken in hand as a rule either on the day of attack, or on the second day of the disease. It is also to be noted that the patients were soldiers in hospital, and therefore presumably men of good physique. The use of large doses of digitalis in pneumonia is not novel. M. Germain Séé has recommended that as large a quantity as seven grains of the leaves be administered per diem in such cases. Hirtz does not consider 11 to 15 grains too much to employ during the same period, and gives the drug in a large quantity (100 parts) of sugared water, a tablespoonful of the mixture being taken hourly. M. Petrescu claims to have exceeded, without hurtful effects and with marked benefit to the patients, all former recorded measures. His material was selected from various drug stores, in order to avoid the risk of error dependent on the special qualities of any given sample, and his results are briefly stated as follows, viz.: (1) The duration of the whole attack is said to be shortened (four days to one week). (2) Fever is strongly controlled and progressively diminished. (3) Sphygmographic tracings show that the pulse is rapidly and decidedly slowed, and dicrotism disappears in great measure and finally altogether, by absorption of the primarily separate dicrotic wave into the descending slope of the main pulse-wave. A regular action of pulse is maintained, as is also the arterial tension from first to last, in apparently due proportion to the heart action and stage of disease. Respirations diminish steadily and gradually in frequency. M. Petrescu accordingly maintains that the doses he employs represent the true therapeutic quantities of this drug in pneumonia; that only when so given can its antiphlogistic action be relied upon; and further that digitalis alone has been able to reduce the mortality from pneumonia to a minimum. (*Progrès Médical*, Oct. 1885.)

**Destruction of Germs by Sunlight.**—M. Duclaux makes an interesting observation on the effect of sunlight on certain pathogenous micrococci, the varieties of which are not enumerated. He has found exposure to the sun's rays for several hours is sufficient to arrest the activity of these germs, and finally proves fatal to them. The bearing of this observation, if confirmed, on hygiene, is obvious. [Professor Tyndall describes an experiment, suggesting a similar action, in *British Association Report*, 1881.] (*Progrès Médical*, Aug. 15, 1885.)

**Cutaneous Affections in Gonorrhœa.**—M. Gilbert Mallet invites renewed attention to the eruptions met with in the course

of gonorrhœa. Carefully excluding all cutaneous eruptions that may be due to errors in diet or the administration of cubeb or copaiba, he classifies the remainder in three divisions. (1) Eruptions closely resembling scarlet fever or measles. (2) Rashes which may be described as those of "polymorphic erythema." (3) Purpuric patches. He produces evidence which suggests a probable relation of cause and effect between gonorrhœa and those of the first group. The eruptions come on for the most part late in the stage of the decline of gonorrhœa, last about twenty-four hours, and are followed by furfuraceous desquamation: they are often associated with severe gastro-intestinal disturbance, and can hardly at first be distinguished from the rash of measles or scarlatina. The second group is distinguished from the copaiba rash by (1) absence of the itching often present in that affection; (2) by the knotty appearance of the erythema; and (3) by the appearance of successive crops of eruption. The evidence in favour of the outbreak of purpuric patches does not seem so satisfactory. Some of the cases are probably those of peliosis rheumatica occurring in patients suffering from gonorrhœal arthritis. M. Mallet rejects the reflex and pyæmic theories of the origin of gonorrhœal rheumatism and the cutaneous manifestations, and argues strongly in favour of the absorption of a specific gonorrhœal virus. (*Revue de Médecine*, June, 1885.)

**Incompatibility of Chloral Hydrate with Potassium Bromide and Alcohol.**—Professor George F. H. Markoe, in experimenting with solutions of chloral hydrate, finds this drug incompatible with bromide of potassium and alcohol. He says: Experiments prove that the alcohol is the cause of the trouble, and the writer thinks that the chloral hydrate is changed into the less soluble chloral alcoholate. The writer found that the addition of potassium bromide, sodium bromide, sodium chloride, and magnesium sulphate to strong solutions of chloral hydrate, together with the presence of alcohol, determined a separation of the liquids into two layers. Ammonium chloride, ammonium bromide, potassium nitrate, and calcium bromide did not disturb the same chloral solutions. The practical lesson to be learned from this incompatible prescription is that alcoholic preparations should not be prescribed with chloral hydrate, especially not in connexion with the bromides of potassium and sodium, because if concentrated solutions are used the chloral will separate as alcoholate, float on the surface, and a great risk will be incurred of giving a large overdose, the patient having received no caution with regard to the necessity of shaking the contents of the bottle before taking a dose. (*Boston Medical and Surgical Journal*, July 23, 1885.)

**Bisulphide of Carbon in Diarrhoea.**—According to M. Dujardin-Beaumetz, bisulphide of carbon deserves to have a wider therapeutic application than it now possesses. The poisonous intoxicant qualities which have led to serious accidents during its manufacture, appear from recent experiments by this observer to be minimised by prolonging the process. He has also been led by the evidence which these afford, to regard this substance when well diluted with water as a valuable antiseptic agent in infectious forms of diarrhoea, particularly in that of typhoid fever. His formula is the following—

Bisulphide of carbon, 25 grammes.  
Essence of mint, 50 drops.  
Water                    500 grammes.

The mixture is placed in a vessel of about 700 ccm. measurement, shaken, and allowed to stand till all deposit has been thrown down. When any of the fluid is drawn off, care must be taken to add water in like quantity to the remainder. Four to ten tablespoonfuls of this solution should be taken throughout the day. Milk is a suitable medium for administration. (*Progrès Médical*, Aug. 1, 1885.)

**Local Treatment in Phthisis and Chronic Bronchitis.**—Encouraged by the success of his local treatment of tuberculosis occurring in the larynx, Reichert has adopted a similar method of treatment for the lung, the direct injection namely of various fluids into the lung through the larynx. Having tried various antiseptics, including thymol, menthol, eucalyptus oil, and salicylic acid, he has found that the solution which gives him the best results is one containing 1-2 grammes (15-30 grs.) of salicylic acid dissolved in 3-6 grammes (1-1½ drs.) of ol. menth. pip. and diluted up to 200 ccm. (7 oz.) with distilled water. He convinced himself by experiment that fluids injected skilfully through the larynx did really in part pass into the smaller bronchi of the lung. The best proof of this, however, was given in the sensations of the patient himself after a successful injection: a slight burning feeling was experienced in the chest, often most marked in the side of the lung most affected, but lasting only for a few minutes. A slight dyspnoea is also felt for a short time afterwards, and sometimes for an hour or half an hour a certain tenderness is left behind. He has never observed the slightest evil effects which could be ascribed to these injections. He considers that the mucous membrane of the bronchi is distinctly less sensitive to the application of external reagents than is generally supposed—indeed to some reagents less sensitive even than that of the nose or pharynx. The stimulating effect the injections have on the mucous membrane of the bronchi he

thinks advantageous—some of the worst cases of laryngeal affections, and the most rapidly fatal cases of phthisis he has seen, having occurred in those in whom all manner of stimulation was carefully avoided both as to speaking and coughing. Nor is the danger of hæmoptysis apparently increased; he has used the injections even in the presence of hæmoptysis, with the result of arresting the bleeding, the blood afterwards coughed up being in the form of small coagulated lumps. He has carried out his plan of treatment in sixty cases, always with uniform good result, and with the willing consent of the patients. The injection is made daily, the above quantity being injected at one sitting. It is best carried out during quiet breathing, and preferably towards the end of expiration, when with the inspiration that immediately follows there is less chance of the fluid being altogether coughed up. The injection should be made as deep into the trachea as possible. The cases most suitable for this treatment are those with catarrh of the apices with slight consolidation and chronic bronchitis; it can also be used during the middle stages of phthisis, but is not suitable for advanced phthisis, nor during acute exacerbations of slowly advancing phthisis. The duration of treatment was generally from one to four months. The *modus operandi* of the injections he considers to be first of all the removal of secretion by the powerful coughing movements induced, and also the healthy stimulating effect the fluid has on the bronchial mucous membrane. In addition the fluid has a certain disinfecting power not only on the parts with which it is in contact, but also, through the vapour which under the body-temperature is given off, on the more distal parts of the lung. (*D. Arch. f. klin. Med.*, Aug. 27, 1885.)

## Notes and Queries.

BYNIN.—Messrs. Allen and Hanburys have prepared a liquid extract of malt which they issue under this name. The liquid form will be often preferred to the syrupy or gelatinous preparations to which we have been accustomed. Bynin, as tested on starch-jelly, has considerable diastatic activity, and as it is by no means unpalatable we believe it deserves a trial if only as a variant when other malt-extracts have at length proved distasteful. It may be used both for the purpose of partially pre-digesting farinaceous articles of diet, and as an independent invalid food.

VACCINATION SHIELDS.—The Medical Officer of the Local Government Board occasionally hears of cases of erysipelas following vaccination, and traceable to the use of old and dirty *vaccination shields*. If in any case, as where a dress is worn dyed with a possibly irritative dye, a vaccinator thinks some means of “protection” to a vaccinated arm to be desirable he had best define the material and the manner of application of such appliance as he judges to be wanted in the particular case; and it appears to the Medical Officer important that every such appliance should be of a kind to be destroyed and replaced whenever it becomes soiled; and particularly that it should not be of a kind likely to be kept for subsequent use. The Medical Officer would, therefore, urge on vaccinators to discourage the use of the so-called *vaccination shields*.

## CORRIGENDUM.

In THE CAUSES AND TREATMENT OF QUINSY, p. 339, line 18, read “and it cannot be the result of cold acting on the body generally inasmuch as a second attack rarely follows,” &c.

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## Department of Public Health.

### THE RELATIONS BETWEEN SMALL-POX AND VACCINATION.

THIS subject is dealt with in an exhaustive manner by Dr. Buchanan, F.R.S., in his recent Report to the Local Government Board.<sup>1</sup> This portion of the report commences by giving a statistical account of the more recent epidemics of small-pox in the metropolis, and by providing means of comparison between London small-pox mortalities of our own time with those which have taken place during the past three centuries. It is then explained that the great reduction of small-pox mortality down to a sixth of what it was in the seventeenth century, and to an eighth of what it was in the eighteenth century, though unquestionably attributable to the general use of vaccination, is not a complete fulfilment of the anticipations of those who at the beginning of the present century saw the power of vaccination as a protection against small-pox, and Dr. Buchanan proceeds to discuss the reasons for this partial failure. The chapter dealing with this subject is of great value; it must be regarded as forming a contribution of the first importance to the subject of the influence of vaccination on small-pox; it supplies a recognised want in so far as it brings information on the question up to current date, and we therefore reproduce the greater portion of it in the original. The Report proceeds as follows:—

#### *Small-pox Mortality at Different Periods of Life.*

In a notable passage in his 43rd Annual Report the Registrar-General says: "In discussions concerning the protective influence of vaccination, too exclusive attention is usually given

<sup>1</sup> Supplement by the medical officer to the Fourteenth Annual Report of the Local Government Board [c.—4516] 1885.

to the change that has occurred since its introduction in the death-rate from small-pox *at all ages*. It is important," he points out, "that not only this, but the changes in the death-rate *at successive periods of life*, should be taken into account." And inasmuch as, during the whole period for which such investigation is possible, vaccination has always been in use, and there has always existed some or other public provision for its gratuitous performance, there are no means, the Registrar-General says, of comparing with precision the small-pox rates at different age-periods before and after the introduction of vaccination. Recognising this, he proceeds to examine the differing mortality from small-pox in divisions of the period of 33 years last past, during which there had been notable changes in the extent to which vaccination had been used by the public and in the nature of the State provision for ensuring its performance. I shall presently have to use the information he supplies.

Now it is true that there do not exist the means of comparing with the precision desired by the Registrar-General the small-pox death-rates at various age-periods before and after the introduction of vaccination. But reasonably accurate measure of any change that has taken place, between the past and the present, in the incidence of small-pox mortality upon one and another age may be got by an examination of the records of small-pox among communities which, although they do not furnish the material for differential age death-rates, yet have recorded the facts about age at death in the case of this disease.

In former centuries, out of a thousand persons dying from small-pox, some 800 would have been children under 5 years of age, and 150 of the remaining 200 would have been between 5 and 10 years of age.<sup>1</sup> I do not know whether in any community these proportions were ever materially smaller. I have

<sup>1</sup> See Mr. Simon's "Papers relating to the History and Practice of Vaccination," p. xxix. and following pages and diagrams; also, in Appendix (A., No. 7) to the present Report, extracts from an "Inquiry," by Dr. M'Vail, "into the Prevalence of Small-pox in Kilmarnock in the last Century." I may here note, from a lately published old record belonging to the University of Cambridge, that in an epidemic year, 1774, in the city of Chester, out of 202 deaths by "natural small-pox" at all ages, 180 were contributed by children under 5, and all the remaining 22 by children between 5 and 10 years old. (These Appendices are contained in the official volume quoted. [Ed. *Practitioner.*])

not been able to find an instance, though I can find cases where infants suffered in still larger proportion.

In the present century, and after registration began, the share of total small-pox mortality borne by English children under 10 did not at first greatly decline from its former amount; children under 5 continued to furnish about 700, and children between 5 and 10 about 130 deaths to every 1,000 small-pox deaths at all ages. When Mr. Simon, in his "Papers" of 1857, took stock of our vaccination experiences, the reduction of the share borne by children was discernible in English records. That descending series of figures which (in the absence of vaccination) had formerly testified to the almost exclusive incidence of small-pox on children, and to the protection against death by second small-pox afforded to those who survived, had now become interrupted by a rise in that part of the series which showed the proportion of deaths borne by adults, particularly by a rise in the figures for ages 20-30. This interruption of the regular descent in the series of figures that showed the small-pox mortality of England at successive periods of life was more visible in the metropolis than in the provinces. Mr. Simon found occasion to observe that the degree of this reduction in relative infantile fatality was far more conspicuous in the Paris than in the London records. In Paris, so early as 1842-51, the children under 5 were no longer bearing four-fifths of the gross small-pox mortality, but only about one-third; the rest of the deaths being contributed by people of higher ages, but most conspicuously by young adults between 20 and 30 years old.

#### *Significance of Change of Incidence as regards Age.*

For explanation of this altered incidence of small-pox upon persons of one and another age, there was of course in the first place the arithmetical consideration that, of necessity, any insusceptibility given preponderatingly to the infants of a community meant (so long as any small-pox continued to exist) a corresponding increase in the proportionate contribution made to the small-pox death register by adults. This consideration sufficed in the case of London, but did not suffice in the case of Paris. For Paris, when contrasted with London, a further explanation of the displaced incidence of small-pox mortality was

required; and Mr. Simon regarded it as meaning a loss by the individual, as he grew up, of the protection afforded by vaccination in infancy. The increased proportion of young adult small-pox in Paris was such as to mean post-vaccinal small-pox; and the age-period in which the increase began to be observable showed the age at which the vaccination which had protected during childhood against the current small-pox was losing its ability to protect the average individual during later periods of life.

The difference between London and Paris in this respect was to Mr. Simon a very startling circumstance. It appeared to indicate a different protection, in the two cities respectively, afforded by the current vaccination against the current small-pox of each. The contrast was such as to suggest to Mr. Simon the question whether it might be dependent on anything peculiar to the French administration of vaccination; and he commends to the critical consideration of the French authorities the question whether the vaccine lymph of Paris was of the same good quality as in London.

#### *Decrease in Share borne by Infants in English Experience.*

Since 1857, as time has gone on, it has been observed that in England the share of small-pox mortality borne by children 0-5 years old has steadily decreased in amount. In the evidence which I had to give to the Royal Commission on Hospitals in 1882 I showed this contribution falling by successive steps from its 700 out of every thousand deaths at the commencement of registration to 560, 550, and 540 in the several five-year periods 1855-9, 1860-4, and 1865-9; and then in the two five-year periods 1870-74 and 1875-9, to 320 and 280, the amount of infantile contribution always keeping very closely the same in London and in the provinces. In the metropolitan small-pox of 1884, the share of small-pox mortality borne by children under 5 has been only 240 out of a thousand deaths at all ages; and another hundred deaths out of the thousand have formed the contribution of children between 5 and 10 years.

The reduction is of course in the first place to be regarded as an expression of the arithmetical fact to which attention is

above called : namely, that the insusceptibility to small-pox gained by the English community has, during recent years and by the influence of recent legislation, been gained in preponderating measure by the infantile section of the community ; wherefore the peculiar incidence of small-pox on the early years of life has to an increasing extent been reduced, and later periods of life are contributing more and more to each thousand deaths by the current disease.

#### *Increase of Rate among Adults.*

We wish, however, to ascertain not only whether grown-up people are contributing a larger share to the prevailing small-pox mortality of the time, but also to learn whether they are really dying from small-pox in larger numbers than formerly, and if so, at what period of life the increase is discernible. With the object of learning this further lesson, the method of observing the proportion of mortality borne by different ages must be abandoned, and we must recur to the records of *death-rates of persons living at each age*. The Registrar-General, as I have said, divides the period 1847 to 1880 (during which the causes of death were abstracted in combination with ages) into portions ; a first, namely, of six years, 1847-53, when vaccination was optional ; a second of eighteen years, 1854-71, when it was obligatory but not efficiently enforced ; and a third of nine years, 1872-80, when it was obligatory and more efficiently enforced by vaccination officers. For England and Wales the mean annual death-rate from small-pox of children under 5 years old in these three several periods fell from 1,617 per million, at which it stood during the period of optional vaccination, first to 817, and then to 323 ; and the death-rate of children between 5 and 10 years fell in a similar way from 337 to 243, and then to 186. The rates for children between 10 and 15 years in the three successive periods of time have remained without much change, having been 94, 88, and 98. At higher ages of life to which I shall immediately recur there has not been decrease but increase in the rate of death by small-pox. Nevertheless, when all ages are considered together, the average annual death-rate by small-pox, 305 per million persons living,

during the period of optional vaccination, is found to have fallen to 223 during the following period of obligatory vaccination, and during the period of enforced vaccination to 156.

Statutory enforcement of vaccination then, as contrasted with its optional use before 1853, has availed exclusively for the protection of those who cannot protect themselves. People aged between 15 and 25 years, the Registrar-General goes on to tell us, used thirty or forty years ago to die at the rate of 109 per million, and now under the system designed for the protection of their juniors they are dying at the rate of 173. Adults between 25 and 45 years, who thirty or forty years ago died at the rate of 66 per million, are now dying at the rate of 141; and persons over 45 years old, instead of dying at the rate of 22 are dying at the rate of 58 per million of their number.

Thus it has become obvious that the transference from infancy to later ages which we have noted as observable in the age-incidence of small-pox mortality in England and Wales is not wholly an affair of abolition of infantile small-pox. There is something more than this wanted to explain an increase in the actual death-rate by small-pox among English adults.

#### *Significance of increased Death-rate in Adults.*

Conducing to an increase in the registered annual death-rates between the first and second period of the Registrar-General, I find two circumstances that deserve mention. These are, first, the probability of small-pox death-rates among adults having been artificially low during the Registrar-General's first period 1847-53; an exceptional number of the men and women of that time having very recently passed through their primary vaccination; and secondly, the increased mobility since the end of that period of the population, essentially of the adult population, which has brought grown-up people ever more and more into towns and into contact with the infectious diseases that find their homes specially in towns. These considerations may, I believe, account for a part, but only a part, of the increase in the small-pox death-rate observable in adults since 1853, the date at which the decrease in the death-rate of children began, thanks to the legislation of that year, to be conspicuous.

The Registrar-General, in the passage I have reprinted from his 43rd Annual Report, explains this recent increase in the actual rate of small-pox mortality among adolescents and adults in England by reference to the following consideration. It is to be observed, that the security against small-pox afforded by an attack of *small-pox* in infancy, though not absolute, does most commonly last through the whole of life. For evidence of this among communities, witness afresh the extremely small fraction of small-pox mortality borne by adults last century, and the perfect regularity observable in old records, in that declining series of deaths, which shows the contributions made by people of successive age-periods towards the general mortality of the disease. The resistance to adult small-pox, formerly afforded by an infantile attack of small-pox, was almost complete and lifelong. It has been exchanged nowadays by a larger number of people for the resistance furnished by the average English *vaccination*. Without reference to changes that may have occurred in this average vaccination between one and another epoch, we know of it that for many people it is of chief avail for the first years after it has been gained, but gets measurably forfeited as age advances. The Registrar-General points out that those who have grown up in recent years in our English communities have in increasing numbers exchanged the lifelong protection conferred by surviving an attack of infantile small-pox, for the protection, less durable in their case, furnished by the average vaccination of the kingdom; and he finds in this consideration the explanation of the circumstances that only 22 deaths per million occurred from small-pox thirty years ago among people past middle life, whereas 58 deaths per million would nowadays occur among people of the same age. According to this explanation thirty years ago English adults were in larger number the survivors of an infantile community which had passed through small-pox, paying an enormous tribute of deaths, but by their survival acquiring a more durable protection against subsequent death by small-pox than the same number of adults would have received from an infantile vaccination.

Your medical officer has inevitably some misgiving as to accepting this explanation of increased small-pox mortality among

adults, allowing him to look on post-vaccinal small-pox as a necessary and constant quantity, though manifesting itself to a greater extent as time passed on. To one who fills the office which I have the honour to hold, the likelihood of change in the protective power of English vaccination between one and another epoch must needs be an element of the problem. We know too well that what is called "vaccination" may be of various characters, the one differing from the other in influencing the recovery of persons attacked by small-pox; and the question, as it presents itself to us, must needs be similar to that propounded by Mr. Simon in respect of Paris forty years ago. It has of course reference to past times: was there, during the successive periods in which these English adults received their infantile vaccination, any deterioration in the vaccination procedures of the kingdom, of a sort to account for the later-born possessing, as they grew up, an inferior degree of protection against small-pox than had been possessed by the earlier-born? In answer I may say that not improbably there was something of such deterioration in successive decades before vaccination was made a matter of State concern and before those measures began to be taken under the auspices of the General Board of Health that had for their object to secure throughout the country the efficient performance of the operation.<sup>1</sup> But while recognising this probability, I see that the time has not yet come for statistical evidence whether the present

<sup>1</sup> Claiming consideration equally with a possible diminution in vaccine protection is the question of a possible intensification in the current small-pox of the country. As regards this, there are not wanting indications of a recent malignity and fatality of the disease, among unvaccinated and vaccinated persons alike, in excess of that which was customarily observed in English small-pox thirty or forty years since. Some evidence on this head, important in the present connexion, was given to the Hospitals Commission of 1881 by Dr. Munk, one of the physicians to the Highgate Small-pox Hospital; and the question will arise for further consideration in a later part of this Report. The Registrar-General, indeed, offers this increase in malignity as an alternative explanation for the acceptance of those who may be dissatisfied with the other hypothesis which he brings forward concerning the increase of adult small-pox mortality; and he points out that, if we must believe small-pox itself to have become more virulent, it is plain that the saving of life due to vaccination has been even greater than hitherto supposed. "For not only did the small-pox death-rate fall with its extended use from 305 per million to 156, but it so fell in spite of an increased intensity of the virus which would, if unimpeded, have enormously increased the mortality." (43rd Report.)

vaccination of the country is for the individual a more durable protection against small-pox than that given to the infants of twenty or thirty years ago.

I find, however, that I may confidently say from the recent experience of my department that infantile vaccination in England is being carried out far more intelligently than in the times to which I have adverted, and year after year with increasing solicitude; that public vaccination is as a rule excellently performed, and much private vaccination also; so that, after all deduction for those bastard operations of which I have had to speak with reprobation,<sup>1</sup> the average vaccination of the country is making good progress towards its proper standard.

#### *Need for Re-vaccination.*

It is to be regretted that all who apprehend the fact that small-pox continues to prevail in England, having largely transferred its fatal incidence from the period of infancy to a later time of life, do not, instead of decrying the agency which has preserved through childhood, accept and urge on others to accept that renewal of protection that may be had by a second vaccination. The English vaccination system, though it provides facilities for renewal of the vaccine protection at puberty, does not provide for any second enforcement of the operation, but leaves the adult to decide whether, in his own interests, he will receive the full measure of protection that vaccination is capable of giving him. Yet in the case of some people there is a period of life between childhood and manhood, before the age of legal responsibility is attained, in which period the protective influence of their infantile vaccination is so far lost as to leave them liable to small-pox, and in some instances to death by small-pox. The German legislature, in enacting its compulsory vaccination law of 1874, had regard to this fact, and considering that the protective influence of vaccination might reasonably be trusted for 10 or 12 years from the time of operation in infancy, directed that all children should be vaccinated a second time during their school period, and made the parent of the child responsible for this being done.

<sup>1</sup> In Report of 1881, reprinted in Appendix A., No. 4. (Appendix not reproduced. [Ed. *Practitioner.*])

*German Experience of Re-vaccination.*

An important report on the influence of this law upon small-pox prevalence has recently been made by a German Vaccination Commission, and it is there shown that during the 10 years last past Germany has not only experienced smaller death-rates by small-pox than ever before, but even has passed from a position of inferiority to England into a position of distinct superiority, as regards its immunity from the disease, and it would appear certain<sup>1</sup> that this result has been brought about through the working of the compulsory re-vaccination law of 1874. In the large towns of Germany, since that date, small-pox death-rates have become actually trivial, whereas in London, Paris, and Vienna there have been several appreciable epidemics, in the case of London, as we have seen, having to an unusual degree their fatal incidence upon young adults.

Respecting the renewal of protection which people can, if they please, obtain by a second vaccination, the familiar experience of nurses in small-pox hospitals hardly needs to be quoted afresh ; but it may here be mentioned that in the great majority of the instances where small-pox has attacked people employed about small-pox hospitals, it has been found as the result of recent inquiry, that there has either been chance exception to the rule of re-vaccination, or the re-vaccination was not done until after the individual had received the infection of small-pox.

*Re-vaccination in Army and Navy.*

As regards Army and Navy re-vaccination, it is shown by a return to Parliament made in 1884, on the motion of Mr. Burt, and reproduced in the Appendix to this Report (A., No. 8), (1) that in the Army the mortality by small-pox has become greatly lessened as the Order of 1858 has come to have more and more effect : the death-rate is now materially below that of the civil population of the same ages ; and (2) that in the Navy the death-rate by small-pox has been reduced since the operation

<sup>1</sup> The extent of the protection afforded to the German adult community by this enforced re-vaccination of individuals cannot indeed, as yet, be exactly measured ; but there would appear to be no question of its having been considerable in amount.

of the Order of 1871, to a third of the amount at which it stood before re-vaccination was required : the small-pox death-rate of the Navy had previously been in excess of that of the civil population and of the Army. I have no further information respecting small-pox in the Army ; but in this connexion the note on page xi. of the present Report should be considered. As regards small-pox in the Navy, the 43 deaths shown by Mr. Burt's return to have occurred in that service in the 11 years following the Order of 1871 are found, on reference to the reports of that department, to be made up of 13 persons who were vaccinated once and once only ; of 12 persons (including 11 Kroomen) who had never been vaccinated at all ; of 12 persons (including 2 foreigners) about whom no information was to be had ; and of 6 persons who had presumably been successfully vaccinated and re-vaccinated. These were the small-pox deaths occurring during 11 years on a mean strength of nearly 60,000 men.

*London Small-pox in 1884.*

Reverting to consider more particularly the statistics of London small-pox mortality in 1884—in a page appended to this Report I give a table (Appendix A., No. 9)<sup>1</sup> based upon facts ascertained for all the fatal cases (1,243 in number)<sup>2</sup> of small-pox ; and in almost all instances ascertained at the instance of your Board by the vaccination officers of London unions. The facts have been derived in such cases from the parents or relatives of deceased persons, whether or not they were stated in death certificates ; and when there could be room for question about the facts of a case, it was recorded with those where the facts were unknown. I have classified deaths of persons resident in London, according as they died at their homes or in hospitals : according as they were found to have been or not to have been vaccinated ; and according to their age. These materials will afford to any one who is disposed to examine the above statements the opportunity of studying for himself the more recent

<sup>1</sup> Appendices not reproduced.

<sup>2</sup> This number differs by 8 from the 1,251 deaths stated by the Registrar-General to have occurred among London residents after inclusion of those dying in hospitals. The difference is believed to be accounted for by the deaths of 8 persons resident beyond London but removed into the Highgate Hospital for treatment.

experience of London. From that Appendix I here extract certain age-particulars in relation to vaccination and small-pox in London during 1884, which I exhibit side by side with some corresponding figures to which I have referred in the text of this report.

Ages at death.	London, 1884.			
	Unvaccinated community.	Vaccinated community.	Total Inhabitants.	
Geneva, 1580—1760.				
Kilmarnock, 1728—1764.				
London, 1848—51.				
Paris, 1842—51.				
0—10 . . . .	961	988	815	397
10—20 . . . .	26½	5	59	133
20—30 . . . .	10	7	83	329
30—40 . . . .	1	—	32	110
40 and upwards	2½	—	11	31
Total . . . .	1,000	1,000	1,000	1,000

From the last column of the above table it will be seen that in respect of the incidence of fatal small-pox on persons of different ages in 1884, the affinities of London have been with Paris of thirty-five years ago; there is no doubt that the distribution is significant of post-vaccinal small-pox. Further, on separately considering those who were unvaccinated, the incidence of 612 deaths only (out of a thousand at all ages) upon children under 10, is seen to be less than was to be expected from the experience of other columns; but this fact is doubtless connected with the immigration of unvaccinated persons of adult age into the metropolis, in excessive numbers as compared with unvaccinated infants, as will appear in the sequel. Of the 86 deaths out of each thousand contributed by "vaccinated" children under 10, the figure contrasts indeed with the contribution of 612 per 1,000 by the unvaccinated, but the rate of death among such children (remaining at 44 per million of their number) is altogether improperly high, and is certainly indicative of that sham vaccination to which I have before had occasion to refer. On a previous investigation of this question, I showed 125 children under 10 dying of small-pox in

London after an alleged vaccination, comprising among their number *one only* who had been vaccinated by a public vaccinator and in the manner contemplated by this Board's instructions (see reprint App. A., No. 4); and, as in 1881, ignorant people may still be found to demand and supply a factitious operation, well known to be inefficient yet passing under the name of "vaccination."

### MILK ADULTERATION.

UNDER the Sale of Food and Drugs Acts there have now been appointed, exclusive of metropolitan appointments, 176 analysts for boroughs and 52 for counties in England and Wales, and of the articles submitted for analysis in 1884, 14·4 were found to be adulterated.<sup>1</sup>

Milk adulteration has always been rightly regarded as one of the offences that most needed to be put an end to, and this mainly because of the serious influence which the adulterated article must necessarily have on the proper development of the young; and it is so far satisfactory to note that, whereas, during the six years ending 1883, the percentage of samples analysed and which were found to be adulterated was 20·9, it was only 17·6 in 1884. Still, this latter proportion is still very large; indeed, there are but few articles in which the percentage is greater. Difficulties, however, stand in the way of the analyst in his dealings with milk. Some are chemical. Thus, the Report quoted above expresses "regret that the difficulty of ascertaining, by analysis, whether milk is naturally poor, or has been artificially diluted, has not yet been overcome, and it is therefore very probable that analysts have refrained in many instances from reporting against milk actually watered, because they have felt obliged to take into account the possibility of its having been given by some cow with a special faculty for yielding milk of extreme poverty."

And now a new, and apparently a formidable administrative

<sup>1</sup> See Fourteenth Annual Report of the Local Government Board 1884-1885.

difficulty is thrown in the way by reason of the decision of the Court of Queen's Bench in the case of *Kirk v. Coates*, which was given last month. In this case a milk-vendor was perambulating the streets of Huddersfield, when the inspector appointed by the borough authority asked him what his cans contained. The answer was that one contained "new milk" and another "old milk," the latter term being locally used to indicate milk from which the cream had been abstracted after standing. The inspector having indicated the can containing "new milk," and the necessary bottles having been produced by his assistant, he requested a supply, stating at the same time that it was wanted for the purposes of analysis. The vendor then declared that the can in question contained "old milk," and when the sample was purchased only the reduced price for such milk was taken. It was not denied that the respondent had originally the intention of selling the milk as "new;" indeed, he made no appearance before the court, and one of the judges stated that possibly he would have cheated if he could, but had not been able to do so. Under these circumstances the question to be determined was whether a vendor who has stated that a given sample of milk is "new," can evade the provisions of the statute by subsequently declaring that the article in question is not what he first asserted it to be? In short, may persons who sell adulterated articles escape the penalty for so doing by declaring those articles to be adulterated when they find that samples are being purchased for analysis. This question must we fear now be answered in the affirmative, for the Court of Queen's Bench have decided in the case referred to, that there had been no sale by the respondent except of "old milk," and so the milk-vendor escapes.

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